Gas Journal

Vol. 274. 105th Year. LONDON, APRIL 29, 1953. No. 4691. Price 1/3
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DETROIT

BRITAIN'S FINEST COOKER

Illustration by kind permission of R. J. Barritt, Esq., Div. Carbonisation Manager.

A bird's-eye view of 14,000,000 cubic feet per day

★

THAT is the capacity of these four "DONKIN" Gas Compressors, installed at Nantgarw Coke Ovens of the N.C.B., South Western Division, with foundations for another machine to pass a further 6,000,000 cubic feet per day.

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RELIABILITY, STURDINESS AND FIRST-CLASS WORKMANSHIP are the keynotes of these machines, which are required to withstand long periods of continuous operation. When requiring a Gas Compressor be sure to get more than a bird's-eye view of a "DONKIN" unit. Let our engineers show you the picture from all angles.

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A

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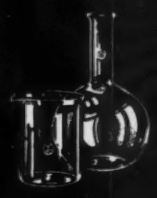
Regd. Trade Mark BRAND

Laboratory and Scientific Glassware



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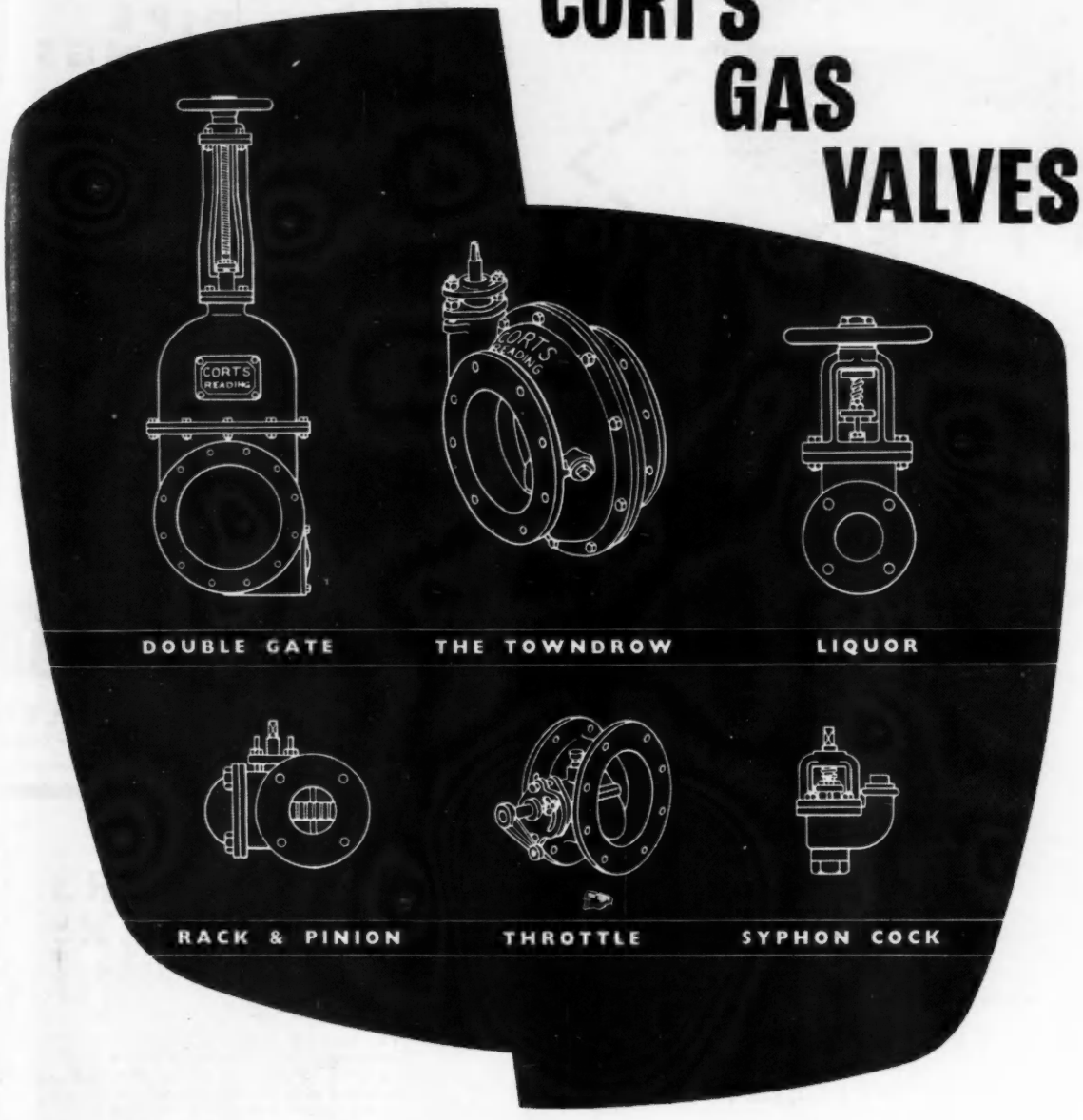

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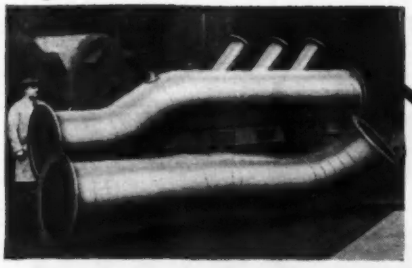

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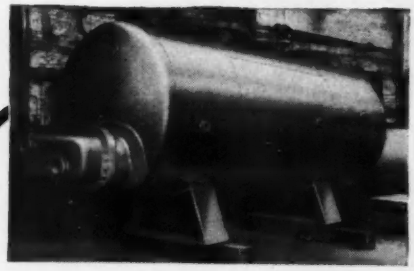
OF BATLEY



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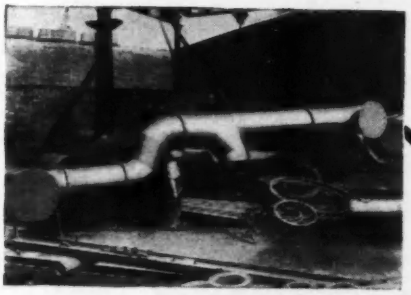

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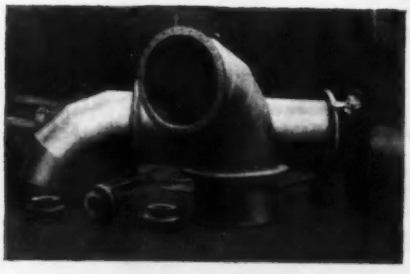

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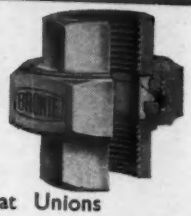

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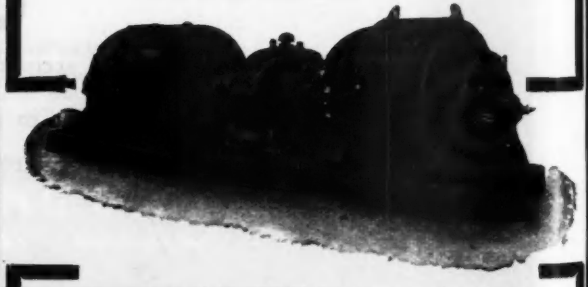

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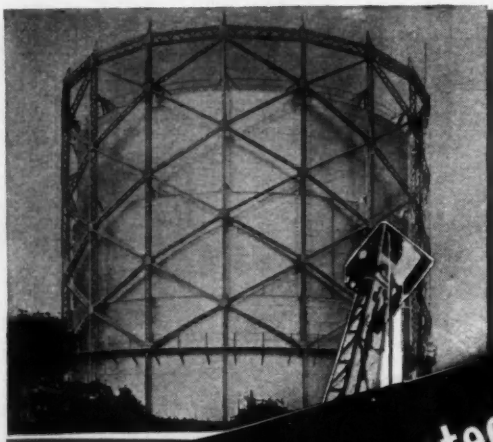
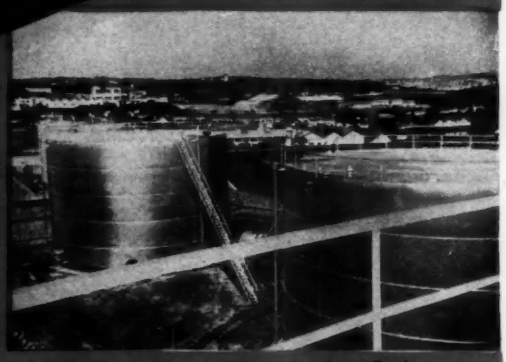


Gasholder in Kent showing brilliance of Atlas Ruskilla Aluminium Paint.

For the protection of metal structures



Spirit Containers, property of Sacor Petroleum Co. in Portugal, coated with "Atlas Ruskilla" Aluminium Paint. High reflectivity of this paint reduces effects of solar heat and consequent loss of spirit by evaporation.

ATLAS RUSKILLA Iron and Steel Preservative Paints have been specifically designed for the enduring protection of all types of structural work. They embody over half-a-century of specialised experience in the manufacture of anti-corrosive paints, and their stamina has been proved in every part of the world. Let us send you Shade Card and prices.

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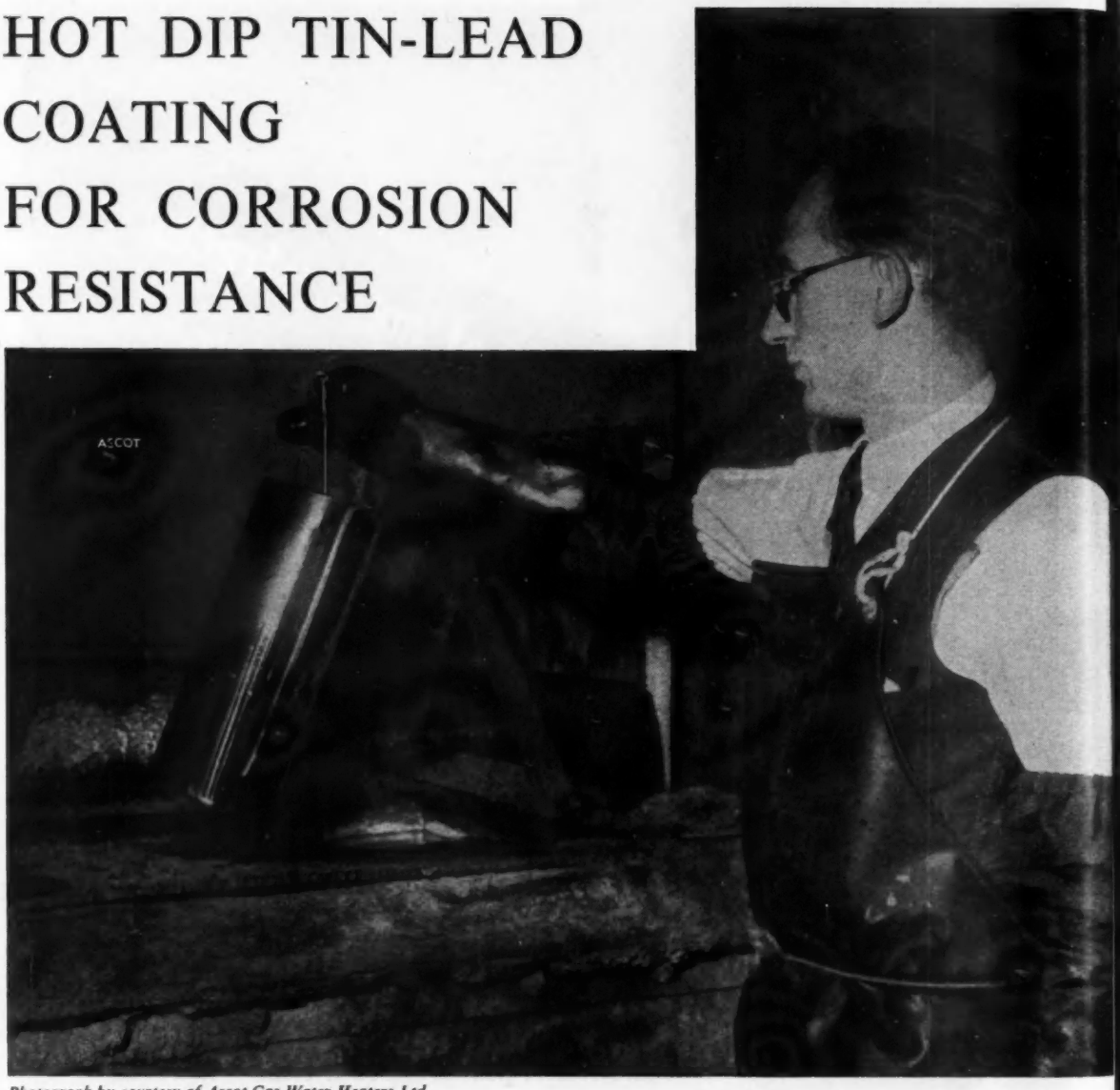

Photograph by courtesy of Ascot Gas Water Heaters Ltd.

FMF

Ascot water heater bodies are hot dipped in a lead-base alloy for extra corrosion resistance. A smooth coating without runs or tears is important, because dipping is followed by a press operation. Fry's metal and Fry's flux see this job through.

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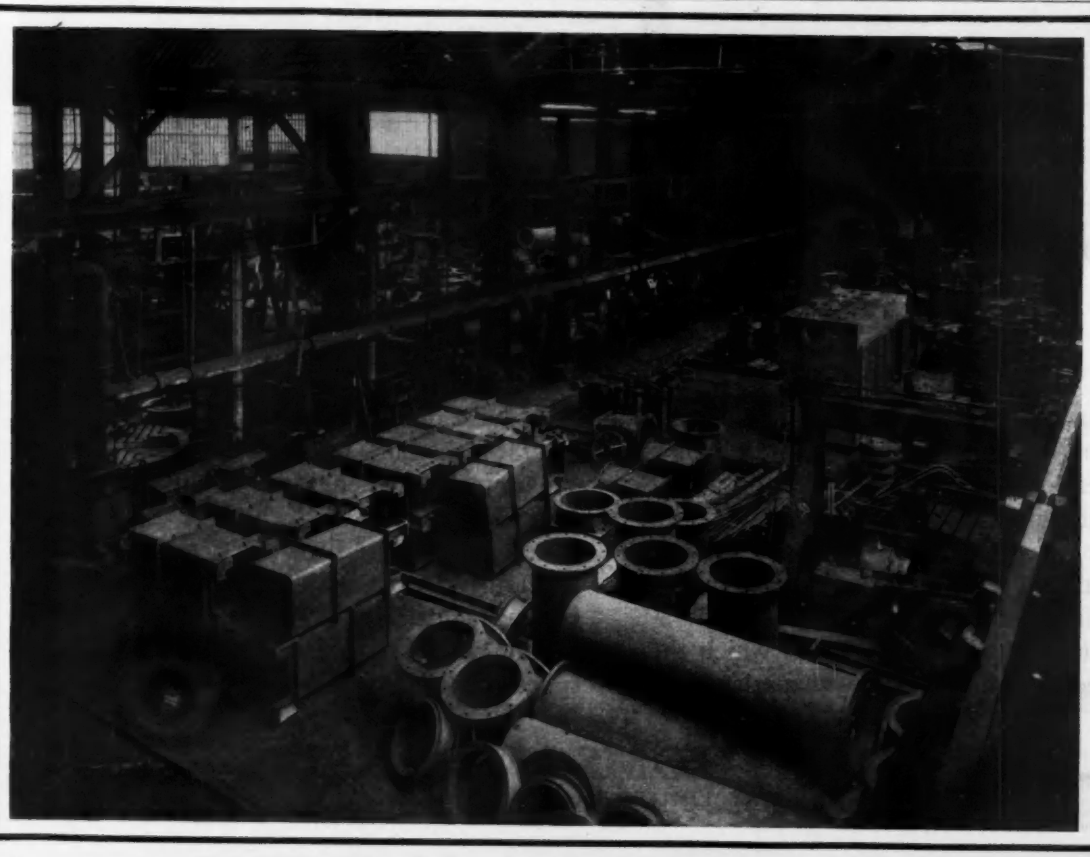

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reduce coke storing charges

Illustration shows Huwood Top-Belt Conveyor stacking coke at the Howdon Works of the Northern Gas Board.

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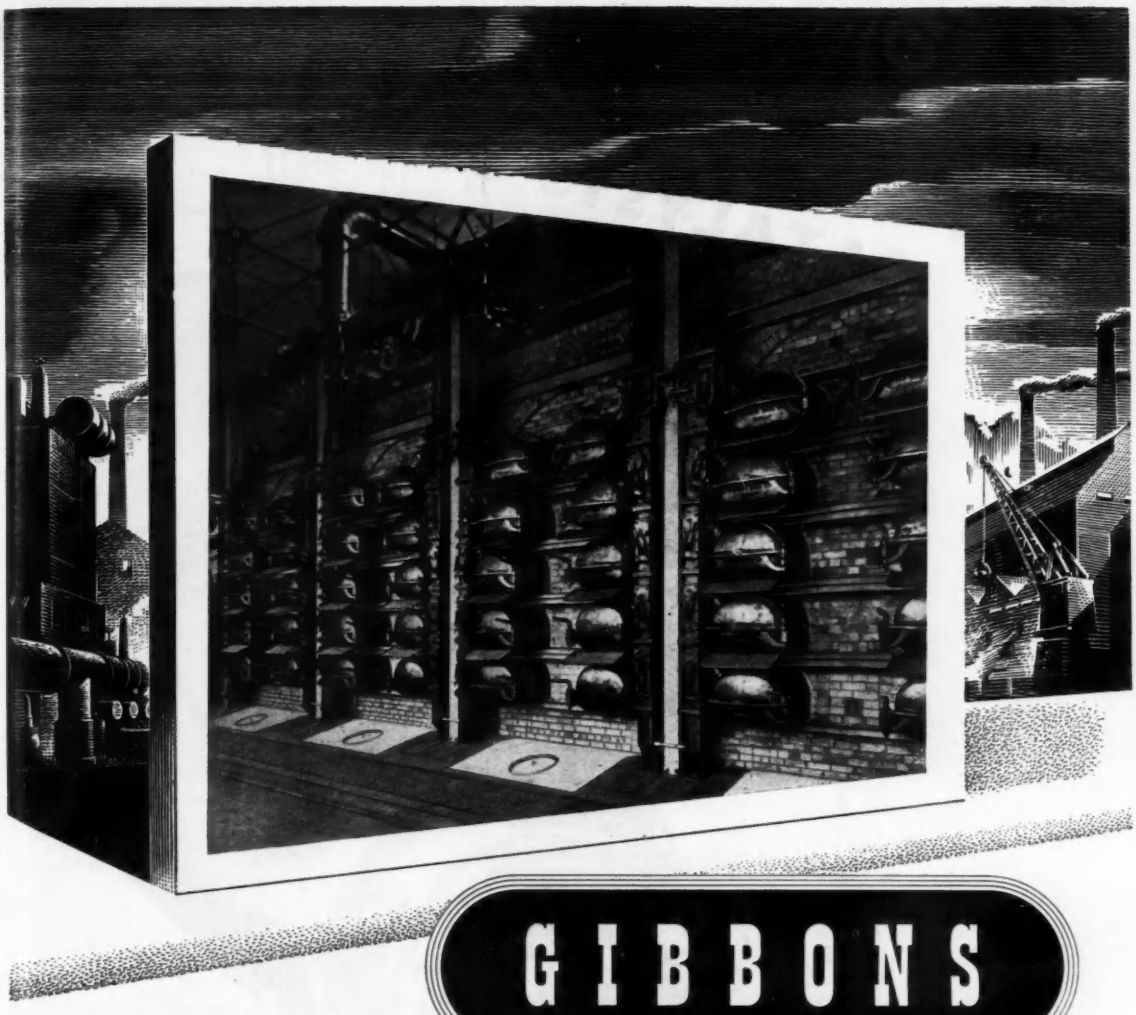

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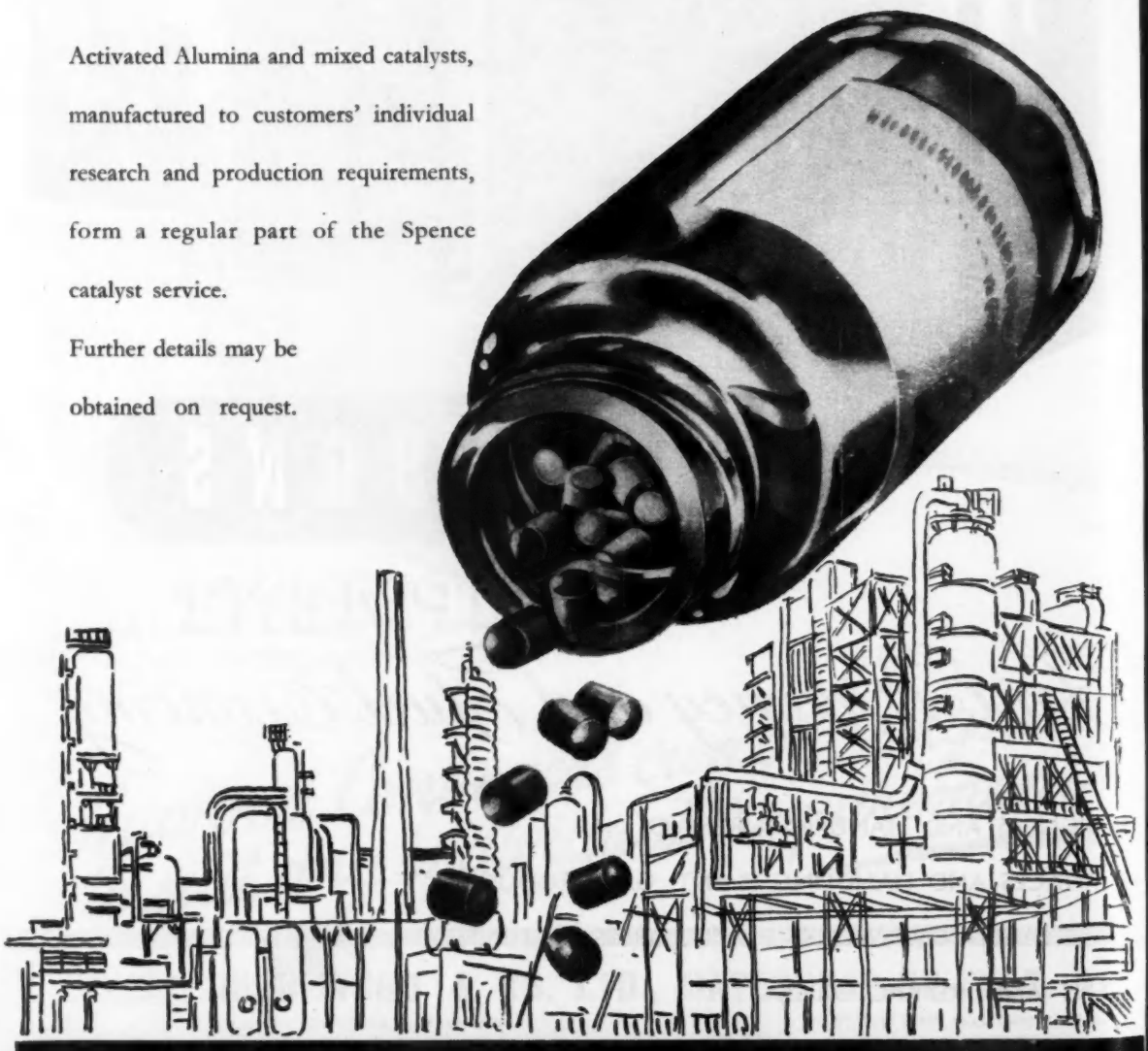

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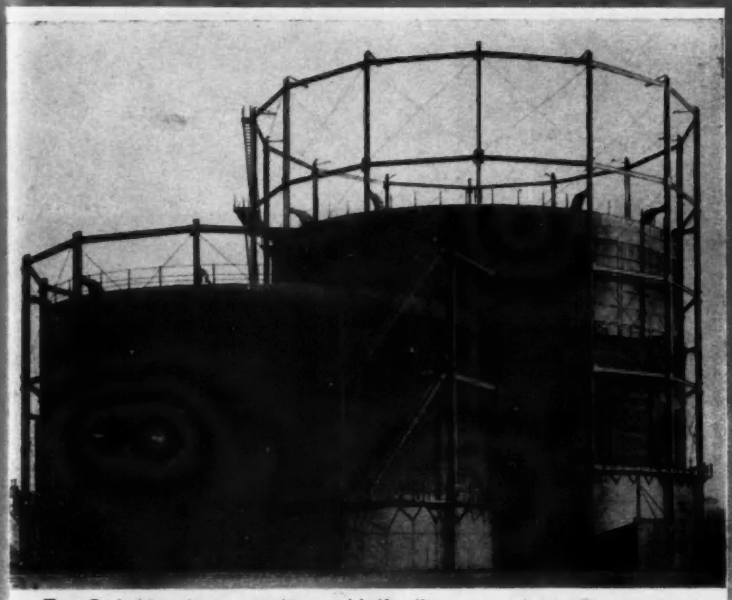

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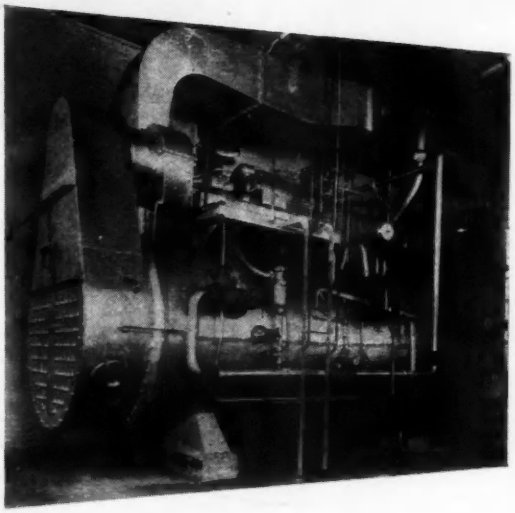
Waste Heat
Recovery Plant



The illustration shows one of the Six Waste Heat Boilers installed at the Howdon-on-Tyne Gasworks—Northern Gas Board. Photograph by courtesy of Messrs. Gas Chambers & Coke Ovens Ltd.

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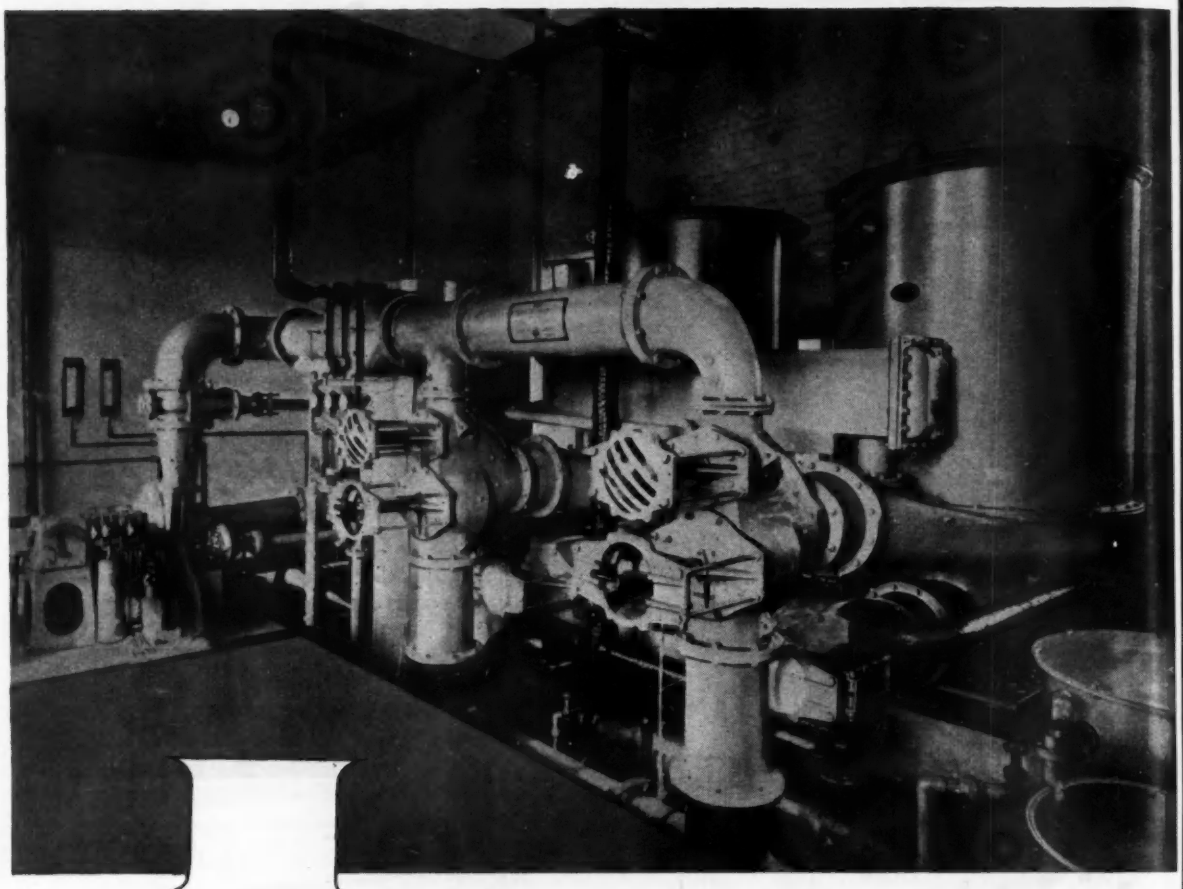

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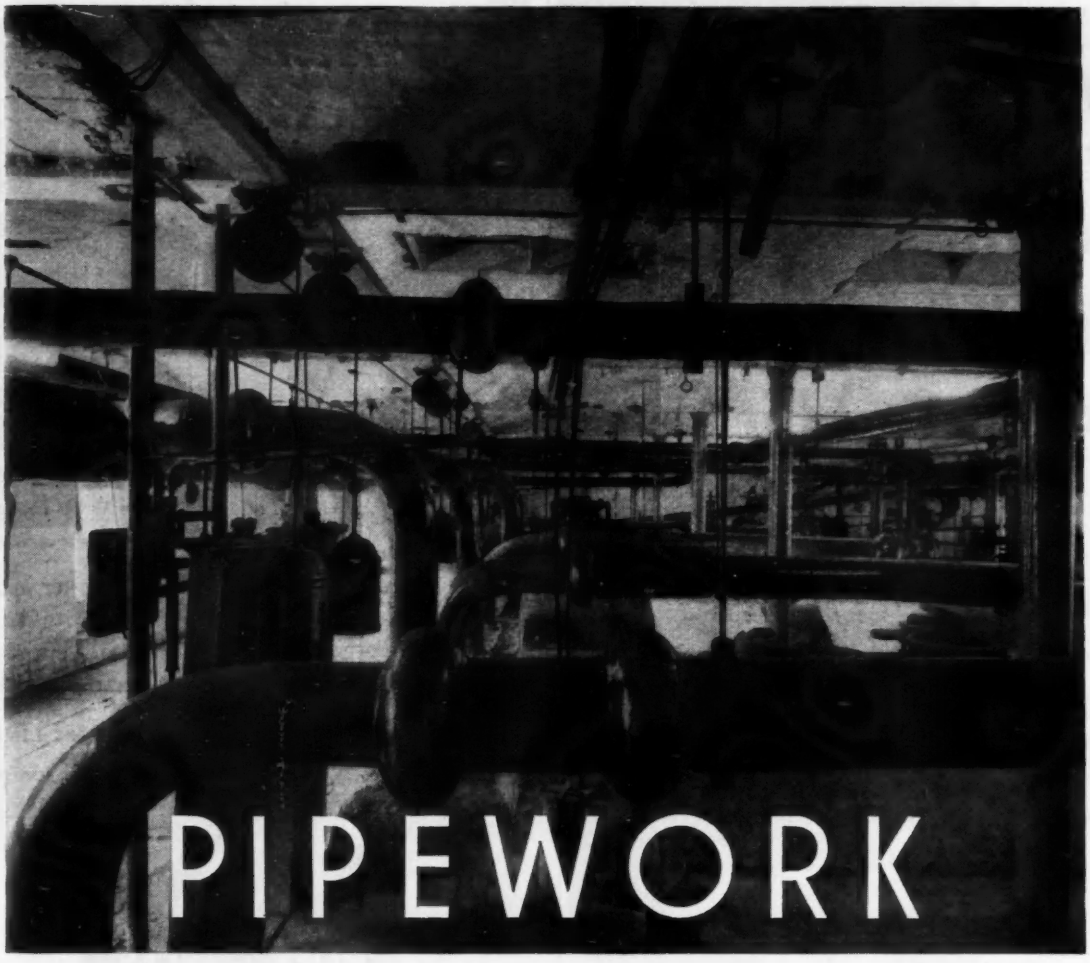

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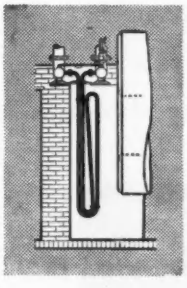

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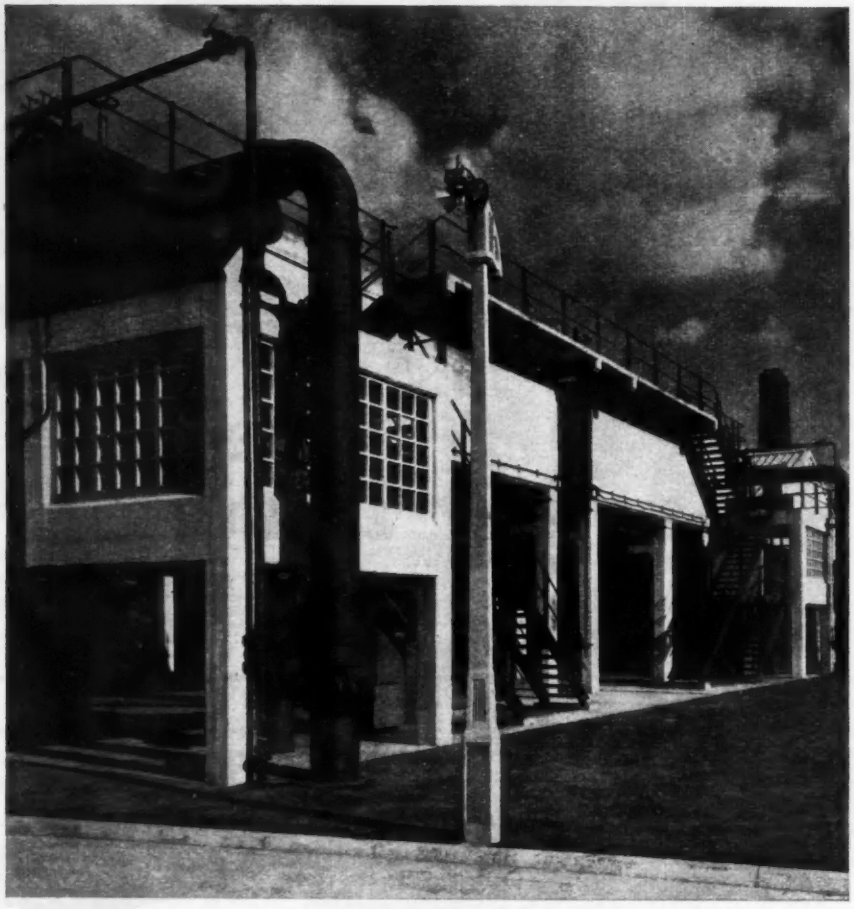

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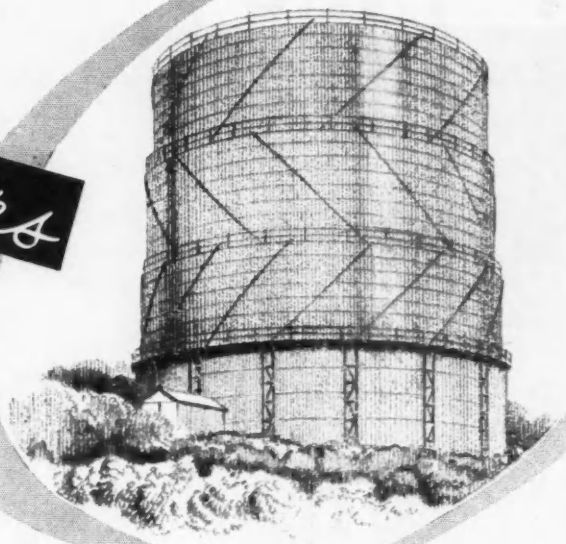
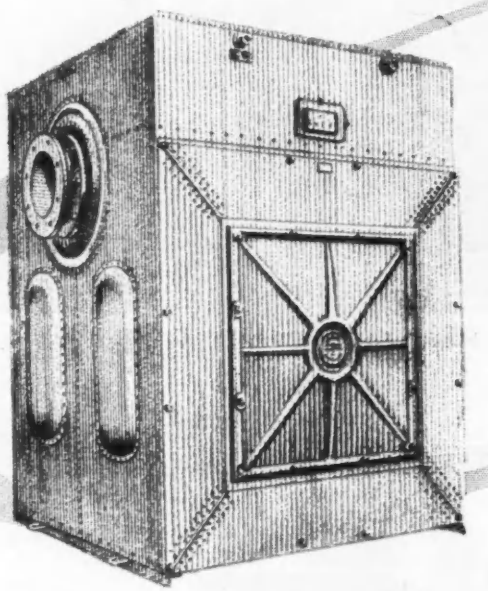
8

Gas Holders



Spiral Guided Gas Holder, with a capacity of 400,000 cubic feet, constructed by the Engineering Section of the Willey Company.



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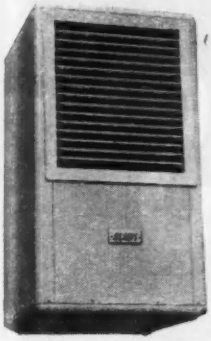

GAS UNIT HEATER
DE LUXE MODEL

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Standard pattern variable gas consumption injector, has been designed to operate efficiently on all gas pressures.
The jet is adjusted by a milled cap to give any desired consumption within the specified range, and is locked in position by a locking ring. Control of the air is effected by a split milled ring on the body of the injector.

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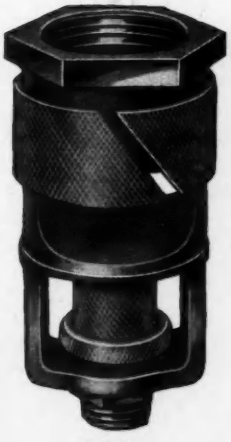

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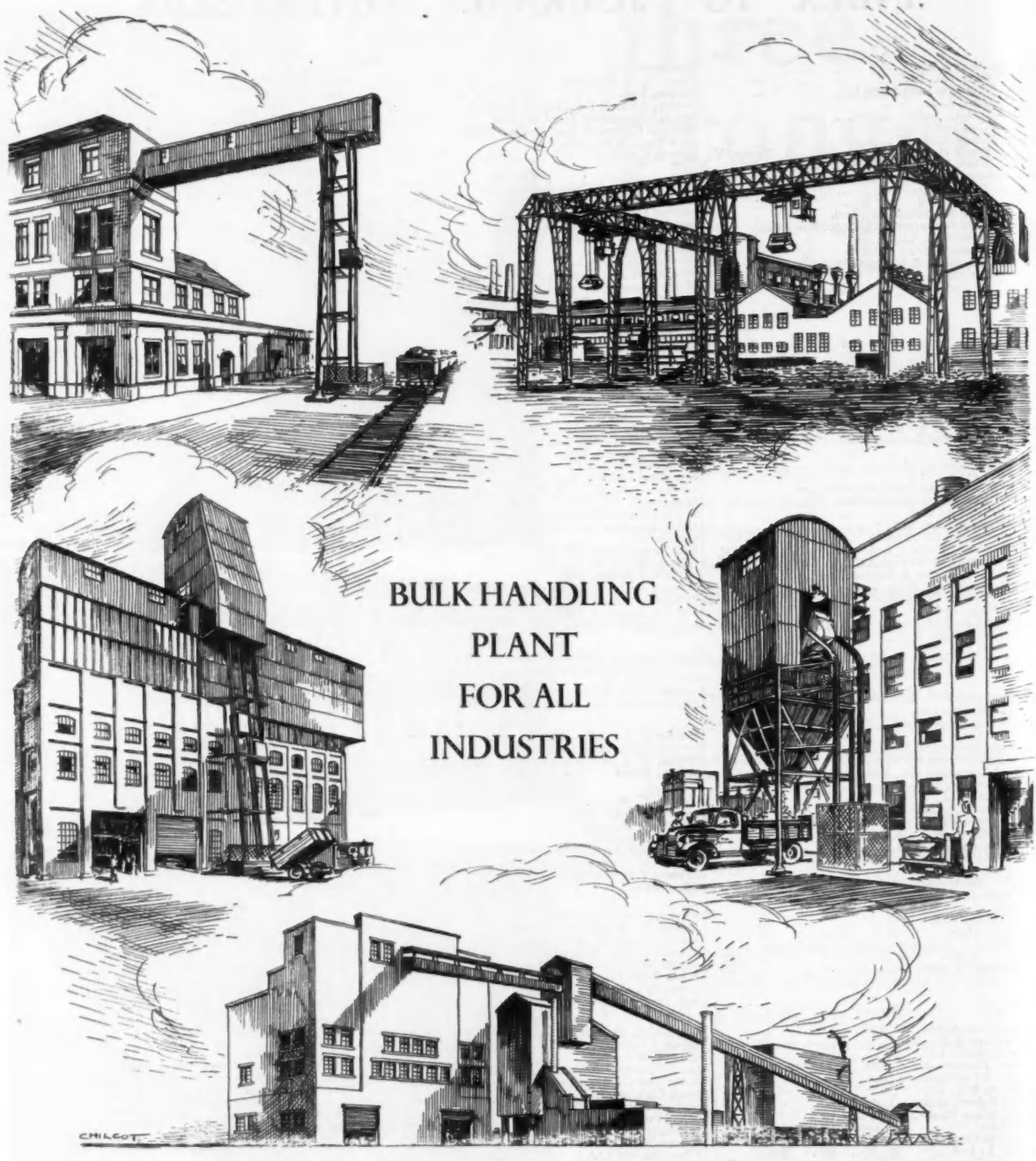

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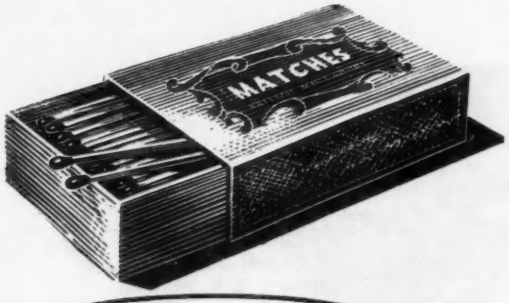

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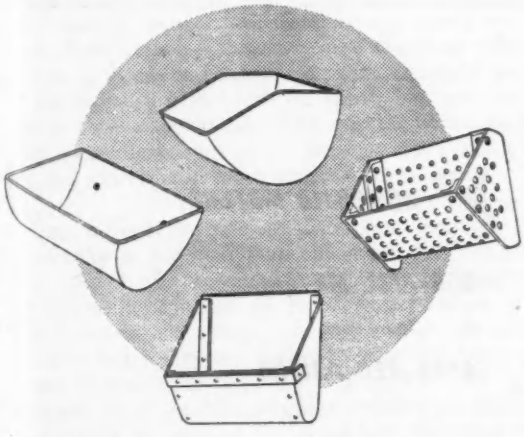

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GAS JOURNAL

VOL. 274. No. 4691 105TH YEAR APRIL 29, 1953

THE SCOTTISH GAS INDUSTRY

SON of a past president of the former North British Association and a member of a fourth generation of gas managers, Mr. Robert Cowie, of Hawick, was well fitted for his task as President at the Spring Meeting of the Scottish Association of Gas Managers and his Presidential Address was most appropriate to the occasion. His review of the trends in the gas industry since nationalisation was based on intimate knowledge of the Scottish background and displayed a keen enthusiasm for the continued success of the industry with which his family has been so long and so closely associated. 'Our working hours,' he says, 'are such a large part of our life that it is a pity if they are not satisfying in more than a material sense.'

The impact of nationalisation was perhaps more disturbing in Scotland than elsewhere, for four out of five Scottish gas managers are responsible for undertakings selling 250 mill. cu. ft. of gas per annum or less. Before vesting date they were responsible only to local laymen; today they are having to learn the team spirit, either as leaders or members of the team. It is a very different thing to submit schemes to fellow gas engineers, particularly in view of the proverbial difference found in expert opinion, but new bonds of fellowship are being forged wherever a true spirit of unselfish service is found. Integration is a rather overworked word in these days. The fact is that integration started many years ago in Lanarkshire, and administrative integration was carried out by former holding companies long before nationalisation accelerated the process Fear that the new regime would result in the stifling of initiative was widely canvassed in Scotland as it was elsewhere but so far as Mr. Cowie has been able to judge there is no actual evidence that those fears were justified.

Before nationalisation members of the Association were proud to style themselves engineers and managers; since vesting date they have become district managers and Sir Andrew Clow, Chairman of the Scottish Gas Board, has made it clear that of the two aspects he regards the managerial side as of more importance than the engineering. In a country comprising mainly small works we suggest that both sides are of equal importance. Mr. Cowie thinks there has been a tendency for some gas managers at least to devote a disproportionate share of their time to the works, and that proper supervision of the service side requires more rather than less time. The sellers' market, he points out, has gone with almost dramatic suddenness and we must either accept the inevitable decline or 'stir our stumps.' For the past 20 years sales and service at Hawick have demanded of the manager and his deputy time and energy equal to the full capacity of one of them, and in meeting the demand he does not think the management has lowered its professional status or stepped down in any way.

The possibility of bulk manufacture and the consequent closing down of small works arouse in many Scottish gas managers a sense of dread and a feeling of loss of prestige, but Mr. Cowie finds difficulty in sympathising with that attitude because, apart from a sentimental attachment to the works, there is real satisfaction in improving gas service at the point at which it is translated into terms of human convenience and where it demands as much managerial skill and knowledge as does any other aspect of the industry. A new danger under nationalisation is that the demands of the organisation itself might consume an increasing proportion of the manager's time and energy, and probably the greatest problem he has to face today is the proper division of his time and energy between competing aspects of his diverse duties. Nationalisation, says Mr. Cowie, is imposing burdens at a faster rate than it is conferring benefits, but he looks to the time when the benefits will catch up. Meanwhile he expresses disappointment that the Ridley Report did not produce a plan calling for the extended development of the gas industry, but he acknowledges that the report has provided the most complete and authoritative survey of the fuel industries ever produced, and that it has at least asserted that within an appropriate framework of prices and tariffs, competition between gas and electricity should continue.

CRITIC ON THE HEARTH

WHEN, a couple of years ago, we welcomed the revival of the B.I.F. Industrial Gas Conference, it was in the belief that it would play a useful part in publicising and co-ordinating the efforts of our industrial engineers who, although apparently quite content to hide their light under a bushel, deserved a wider recognition of their talents. That the conference has caught on may be judged by the fact that what was formerly a one-day event has this year been extended to two days. It is essentially a friendly gathering and is not so self satisfied that it cannot take criticism. Indeed, one of its customs is the reception of an address by a leading industrialist who is encouraged to deliver a fair number of home truths. We wonder how far this humbling—even masochist—practice will be allowed to extend if this year's pill, uncoated as it was and of formidable proportions, was a foretaste of the medicine we must expect in years to come.

Mr. A. G. B. Owen, Chairman of the Owen Organisation, is a gentleman well qualified to address a gas gathering, since at his main works at Darlaston over 100 mill. cu.ft. of town gas and over 800 mill. cu.ft. of Mond gas are used in a year; and in addition over 50 mill. cu.ft. of town gas is purchased each year for branches of the main works. Obviously, then, the Owen Organisation are large consumers of gas—but are they satisfied customers? Any hopes we might have cherished of hearing a hymn of thanks to Mr. Therm were soon dispelled. 'Under nationalisation,' said Mr. Owen, 'we have suffered a number of disadvantages without there being any corresponding advantages. We had hoped under nationalisation that there would be one tariff for the whole country, and that we should be able to take the whole of our gas wherever it might be used on that one single tariff. Instead of that we have even lost the advantage which we once had of grouping accounts from one source of supply.' And he went on to complain that because his main works were under two local authorities he paid 11¼d. for gas on one side and 1s. 2d. on the other. Moreover, in some parts of the country mains were laid free of charge and the customer—*i.e.*, a member company of the organisation—supplied the meters; while in other places the customer paid for the main and the undertaking supplied the meters. He went on to mention many other instances of inadequate or illogical treatment.

Warming to his subject, Mr. Owen launched an attack on committees and the consequent delay in obtaining a decision. 'I hope,' he said, 'that greater latitude will be given to individuals in charge of various sections of this great undertaking by more executive power being granted to them, and if in certain instances the wrong decisions are made they will not get unduly blamed because if only 10% decisions are incorrect, if the rest are made promptly, probably there will be greater assistance rendered to industry and greater savings will accrue to both sides.'

Mr. Owen saw no evidence of healthy competition with electricity which, he felt, was a keener industry with a fuel possessing technical advantages for many applications. And he apparently regarded oil as a very strong opponent, and considerably cheaper. Lastly, he maintained that information concerning the future plans for gas were entirely unavailable, and called for a much freer dissemination of information. 'My criticism,' he said, 'is not that we cannot get assistance when we ask for it, but we want to see it served up to us on a plate.'

We have mentioned only what appeared to us to be the spearheads of his attack. These were fightin' words and there were many pinpricks besides. Mr. G. Le B. Diamond, when he rose to thank the speaker, looked very grim indeed. Taking his text from the Second Book of Samuel and clearly likening himself to Asahel, who was smitten with the hinder end of a spear under the fifth rib, Mr. Diamond pointed out that there were good answers to all the criticisms Mr. Owen had made and proceeded to give some of them. He was rightly proud of the efficiency and growth of gas making in the West Midlands area, and he stressed the petty restrictions which hamper expansion, such as his having to obtain a licence to lay 71 yds. of lino in a showroom. Mr. Diamond had the last word, and it is his keen humour, Sir Harold Smith's pleasing chairmanship, and the excellence of the gas section at the Fair which will make this year's conference an event to be remembered.

A GREAT EVIL

THERE was fog in the Meuse Valley in 1930. This fog cost 60 lives. In 1948 there was fog at Dorona, Pennsylvania, which resulted in 20 deaths. Both these peculiar fogs were regarded—as is pointed out in special articles in *The Times*—as national disasters, and they were subjected at once to full public inquiry. Fog and mist are natural phenomena. They occur at sea, where there is no smoke, they occur in districts inland where smoke is not a contributory factor. But when fogs become contaminated by smoke and sulphur in cities and in industrial areas they become dangerous. Last December London was beshrouded in a most filthy, most dangerous, fog for four days. People with strong constitutions carried on, spluttering and coughing, with eyes smarting and with hands dirty, with their work amid the gloom. People with weaker constitutions had sorrier fate. There was much illness, and no fewer than 4,000 deaths were directly attributable to this noxious smoke-fog. The London episode has not been investigated, and only recently, notably through the columns of *The Times* and the *Observer*, and in a penetrating analysis in *Smokeless Air*, the journal of the National Smoke Abatement Society, has it been brought into its proper perspective.

Smoke from the domestic chimney has been reduced to the extent that gas, electricity, and oil, have replaced raw coal in the open hearth. But pollution of the air has not diminished. What has been gained in one direction has been lost by the emission of flue dust and grit discharged in more concentrated form from power stations. The total amount of solid matter emitted and the amount of pollution by sulphur have on balance remained unaffected. And the causal connection

between smoke pollution and mortality in London during the fog of December, 1952, is proved beyond doubt. The writer of the articles in *The Times* comments that a reduction in coal consumption, of, say, 10%, would result, owing to improved methods of combustion, in more than a proportionate reduction in smoke emission. A recent survey carried out on behalf of the Coal Utilisation Council (*Gas Journal* of March 4, p. 498) 'revealed' that 44% of the households investigated would like, on an average, an additional 14 cwt. of coal—a total for the nation of 4½ mill. tons a year.

A GRAVE INJUSTICE

IN OUR ISSUE today we publish what we consider to be a most important letter on what is undoubtedly an important subject. The letter concerns the abandonment since nationalisation of the practice of advertising contracts for new gasworks plant in the technical Press—a change which must embarrass and dismay several of the manufacturing firms. Our correspondent refers to the change as 'a grave injustice,' and we agree with this view, for it strikes at the principle of fair trading, which demands equality of treatment and opportunity in a competitive field. Not only this; there is, as the writer points out, the wider economic issue. What is the answer to the contention that restriction in competition results in increase in prices? It is certainly a contention which ought not to be ignored.

Personal

Dr. W. Idris Jones, Director-General of Research to the National Coal Board, has been unanimously elected by the Council of the Institute of Fuel as President for the 1953-54 Session. He will succeed Dr. G. E. Foxwell in October.

Mr. A. L. Hancock, B.SC., has been elected a Director of Walker, Crosweller & Co., Ltd., and of their subsidiary, the Arkon Manufacturing Co., Ltd. Mr. Hancock joined Walker, Crosweller & Co., Ltd., seven years ago in charge of Arkon instrument design and has been responsible for many new and exclusive features that are to be found in Arkon instruments.

Mr. D. P. Welman, Chairman of the North Western Gas Board, replies to the toast of the benzole producers. The occasion was the dinner at which the Lancashire Division of National Benzole Co., Ltd., was awarded the championship shield for sales by Mr. H. H. Bates, Managing Director. Others in the picture are, left to right, H. H. Bates and H. J. Rayman, Secretary.

Mr. R. W. Rutherford, who joined Ashmore, Benson Pease and Co., Ltd., and the parent organisation, the Power-Gas Corporation, Stockton-on-Tees, in 1917, has been appointed Deputy Managing Director. Mr. Rutherford was formerly representative in Japan and in 1938 was appointed technical sales manager. In 1944 he was appointed a director of Ashmore Benson and four years later was elected to the board of the Power-Gas Corporation. He is also a director of Rose, Downs and Thompson, Ltd., Hull, an associate company.

Mr. W. R. Clark Lewis, M.INST.T., has retired from the position of Traffic Manager to Babcock & Wilcox, Ltd., after 45 years service. Mr. Lewis first joined Babcock & Wilcox, Ltd., in the erecting department, in 1907, and transferred to traffic work in the invoice department in 1911, eventually taking charge of the traffic department on its inception in 1933. Mr. Lewis is succeeded as Traffic Manager (London) by **Mr. K. J. McBryde,** who joined Babcock & Wilcox in 1950. He was previously on the staff of the Commercial Superintendent, British Railways (Western Region), where he had 20 years experience in railway traffic problems.

Dr. Harold Hartley, C.B.E., was, as reported on a later page, awarded the Melchett Medal of the Institute of Fuel at the annual luncheon of the Institute on Thursday last. Dr. Harold Hartley was appointed Chairman of Radiation Ltd., in January, 1949. He is a Past President of the Institution of Gas Engineers and a recipient of the Birmingham Medal of the Institution. From 1938 to 1945 he was Chairman of the Council of the Cast Iron Research Association and was a member of the Council of the Gas Research Board from its inception till the winding-up of the Board in 1952.

Mr. C. Singleton, who has been associated with Woodall-Duckham (Australasia) Pty., Ltd., of Melbourne for 25 years and who has been Managing Director for 16 years, has retired from the company's service. **Mr. L. T. Nettlefold,** Chairman of the company, has agreed to act as Executive Chairman for the next few years. He is also Managing Director of T. S. Nettlefold & Sons Pty. Ltd., and a Director of a number of other companies in Australia. **Mr. B. W. S. Page,** Managing Director of Page Engineering Co. Pty. Ltd., has agreed to become an additional member of the Board. **Mr. A. H. Reid,** a Director of the company, has been appointed General Manager. He was on the engineering staff of the Woodall-Duckham Vertical Retort & Oven Construction Company (1920), Ltd., London, before he went to Australia in 1937. **Mr. S. Foster** has been appointed Manager of the company's refractory brickworks at French's Forest, Sydney. Arrangements have been made whereby the Woodall-Duckham Company, London, has purchased a majority shareholding in the Australian company, thus ensuring still closer collaboration and interchange of technical information, services, and personnel than in the past in order to meet the growing requirements of the gas industry in Australasia.

Obituary

Mr. George Helps, Junr., who retired from the post of Engineer and Manager of the Nuneaton District, West Midlands Gas Board, at the end of 1952, died suddenly on April 23 at the age of 67. He was apparently in his normal good health but after mowing the lawn at his home he collapsed and died shortly after admission to hospital. It was on July 31 last year that his father, Mr. George Helps, who had retired from the Board of the former Nuneaton Gas Company in 1946 after many years of service as Engineer, Manager, and Secretary, died at Burnham-on-Sea in his 88th year. The elder George Helps, one of the outstanding characters in the industry of the past generation, started his long and active career at the head of the Nuneaton undertaking in 1898. George Helps, Junr., joined the undertaking in 1911 and succeeded his father as Engineer and Manager on his retirement in 1946.

Letter to the Editor

ADVERTISING OF CONTRACTS

DEAR SIR,—You may or may not be right when you state in your issue of April 15 that a great number of people in the gas industry are recognising that the advantages of the change wrought by nationalisation outweigh the disadvantages. There is, however, one change which must surely have been for the worse, and that is the abandonment of the old practice of advertising contracts for any new gasworks plant in the technical journals.

Before nationalisation, whenever new gas plant was required, the fact was advertised so that any manufacturer could send for the enquiry and specification forms, inspect the site, and send in a quotation. Now, only certain manufacturers are allowed to quote, and any manufacturer not specially selected for the purpose has no chance of obtaining the order, or even of knowing that any such work has been under consideration.

This, of course, constitutes a grave injustice to those manufacturers who are thus ignored—the gas industry belongs to them as much as anyone else and they should have equal treatment with their competitors. That is the more personal aspect of the question, but there is a much wider economic issue, for it is quite certain that restriction in competition can only mean an increase in prices.

Can it be doubted, for instance, that 15 quotations for a gasworks plant would not be more likely to produce a lower price than just a selected five? It does indeed seem strange that a nationalised industry should, in these days of financial anxiety, so willingly deprive itself of all the benefits which flow from free and full competition.—Yours faithfully,

PURIFAN.

April 21, 1953.

Diary

April 27-May 8.—British Industries Fair, Castle Bromwich. Gas Council Stand No. D.641/540.

April 30.—North Thames G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2.

April 30-May 2.—East Midlands Gas Board: Fourth Annual Staff Conference, Skegness.

May 1.—London Juniors: 'Southampton's Gas Distribution System,' R. K. Harrison. 178/180, Edgware Road, W.2. 6.30 p.m.

May 5.—East Midlands G.C.C.: Victoria Station Hotel, Nottingham, 11.30 a.m.

May 7.—North of England Section, I.G.E.: Annual General Meeting, Old Assembly Rooms, Newcastle-on-Tyne, 11.30 a.m.

May 7 and 8.—Combustion Engineering Association: Annual Conference, Palace Hotel, Buxton, 10 a.m.

May 7.—Manchester, Yorkshire, and Wales (North) Juniors: Joint visit to Gaythorn and Partington works, Manchester, 11.30 a.m.; 'Producer Gas in the Gas Industry,' I. J. Harthill, 5.30 p.m.

May 9.—Midlands Juniors: Visit to the works of the Widnes Foundry and Engineering Co., Ltd., leaving Birmingham 8.30 a.m.

May 11-16.—Glass Industries Exhibition, New Horticultural Hall, Westminster. Gas Council exhibit.

May 2.—Yorkshire Juniors: 'Works Practice,' C. H. Rickard, Gas Showrooms, Davey Gate, York, 2.30 p.m.

May 5.—London and Southern Section, I.G.E.: Chairman's Address and Luncheon. Connaught Rooms.

May 8-9.—British Gas Staff Association: Annual Conference. Hotel Metropole, Brighton, 10 a.m. each day; Conference Banquet May 8, 7 for 7.30 p.m.

May 9.—Eastern Juniors: Annual General Meeting to be followed by afternoon visit to places of interest in the neighbourhood. King's Lynn.

May 9.—Scottish (Western) Juniors: Afternoon Visit to the Dumbarton Gasworks.

May 13.—National Benzole Association: Annual General Meeting, Wellington House, Buckingham Gate, S.W.1. 3.15 p.m.

May 16.—Scottish (Eastern) Juniors: Golf Outing, Aberdour.

May 16.—London Juniors: Tour of North Thames Gas Board's Beckton Trunk Mains System and Westminster Control Room. 2.0 p.m.

May 18.—Eastern G.C.C.: Connaught Rooms, 2 p.m.

May 27.—South Western Section, I.G.E.: 'Some Attempts Made to Reduce the Cost of Gas Production,' J. E. Wilkes and J. A. Bell. Taunton.

INSTITUTION OF GAS ENGINEERS

THE following is a summary of the programme arranged for the 90th annual general meeting of the Institution of Gas Engineers, which will be held in London on May 19, 20, 21, and 22, under the Presidency of Mr. G. E. Currier, O.B.E., Deputy Chairman of the North Eastern Gas Board. The business sessions will be held at Church House, Westminster.

Tuesday, May 19:

10. a.m. Opening of the meeting at Church House, Westminster. Welcome to representatives from overseas; adoption of the 90th annual report and accounts; presentation of medals.

10.25 a.m. Presidential Address by G. E. Currier, O.B.E.

11 a.m. to 12 noon. Presentation and discussion of paper on 'Some Modern Problems in Furnace Heating,' by R. J. Sarjant, O.B.E., D.SC., Professor of Fuel Technology, University of Sheffield.

12.45 p.m. for 1 p.m. President's luncheon at the Savoy Hotel, Victoria Embankment.

3 p.m. to 4 p.m. Presentation and discussion of paper on 'Some Special Aspects of the New Swan Village Gasworks,' by S. K. Hawthorn, Divisional Engineer, Birmingham Division, West Midlands Gas Board.

4 p.m. to 5 p.m. Presentation and discussion of paper on 'Some External Influences on the Future of Gas,' by H. Johnston, Chief Engineer, North Eastern Gas Board.

8 p.m. to 1 a.m. Reception and dance, Grosvenor House, Park Lane.

Wednesday, May 20:

9.30 a.m. Presentation and discussion of paper on 'The Blending of Coal for Carbonisation, with special reference to Oven Coke Manufacture,' by G. E. Hall, and G. W. Lee, British Coke Research Association.

10.45 a.m. General meeting of contributors to the Benevolent Fund of the Institution of Gas Engineers.

11 a.m. to 12.15 p.m. Presentation and discussion of paper on 'The Functional Design of Gas and Coke Burning Appliances,' by N. Hudson, Chief Commercial Officer, North Eastern Gas Board.

1.45 p.m. to 6.15 p.m. Alternative visits to Waddon works of the South Eastern Gas Board; Streatham works of Smith Meters, Ltd.; British Coal Utilisation Research Association, Leatherhead; and Dagenham works of Briggs Motor Bodies, Ltd.

2 p.m. to 6.30 p.m. Visit to works of the British Thermostat Co., Ltd., Sunbury-on-Thames; and ladies' visit to the R.A.C. Country Club, Woodcote Park, Epsom.

8 p.m. Concert by the Philharmonia Orchestra in the Royal Albert Hall.

Thursday, May 21:

9.30 a.m. Presentation and discussion of paper on 'Expansion of a Horizontal Chamber Setting,' by J. Southworth, Draughtsman, Liverpool Group, North Western Gas Board.

10.15 a.m. to 11.15 a.m. Presentation and discussion of paper on 'Operation of the Manchester liquid purification plant at Linacre, Liverpool,' by L. G. Townsend, Assistant Engineer (Chemical), Liverpool Group, North Western Gas Board.

11.15 a.m. to 12 noon. Discussion of report of productivity team representing the British gas industry, which visited the United States in 1952, opened by J. H. Dyde, who led the team.

12 noon to 12.15 p.m. Concluding business of meeting.

12.30 p.m. for 12.45 p.m. Council luncheon to the President.

1.45 p.m. to 6.15 p.m. Alternative visits to Waddon works of the South Eastern Gas Board; Building Research Station, Garston (Watford); and Luton works of Radiation Ltd.

2 p.m. to 6 p.m. Visit to Bankside power station of the British Electricity Authority.

2.15 p.m. to 5.15 p.m. Visit to the Royal Festival Hall.

2 p.m. to 6.30 p.m. Ladies' visit to London Airport.

Friday, May 22:

9.30 a.m. Visit to Upper Thames Valley; motor coach to Marlow; launch down river to Maidenhead; luncheon at the Riviera Hotel, Maidenhead; launch down river to Windsor, tea on board; choice of early and late coaches arriving Belgrave Square 6 p.m. and 7.45 p.m.

Refractories in the Making

ON March 18 the President of the Eastern Junior Gas Association, Mr. J. Anderton (Gt. Yarmouth), supported by some 50 members and guests, visited, by kind invitation of Mr. P. K. Banks, the Fireclay Works of Williamson Cliff, Ltd., at Stamford.

Members assembled at Ye Olde Barn Restaurant for luncheon together with the Directors of Williamson Cliff, Ltd., and Mr. Bernard Clarke, M.B.E., General Manager, Lincolnshire Division, East Midlands Gas Board. In a short speech Mr. BANKS expressed his pleasure in having the Association at Stamford and the President suitably replied.

Prior to a tour of the works, Mr. GREEN, the Technical Director, gave a short description of the works and its products, and in his introduction pointed out that this is as much an age of specialisation in refractories as in other products and research is considered of first importance.

All refractories manufactured at the works are of the silico-alumina type, and may be roughly classified according to their alumina content, which ranges from 15% up to 80% in the super-refractory field. Three types of clay of very varying compositions are found on the works property, and from these are manufactured three types of firebricks to the I.G.E. specification—namely Grade 1, Grade, 2, and Siliceous. In addition high alumina clays are imported from other parts of the country to give a 42-43% dense alumina brick for producer work where high refractoriness and resistance to slag attack are important.

One part of the works is devoted to the production of super-refractories for which ball clays are drawn from Dorset and Devon, china clays from Cornwall, and minerals from India and the United States. These super-refractories consist of sillimanite, molochite, 65% alumina and 80% alumina bricks for use in cement kilns, blast furnaces, and high temperature furnaces.

In manufacture the various clays and grogs (prefired clay or crushed bricks) are ground, screened, and blended, after which the material is made up into bricks and shapes by one of three different methods:—

(1) Semi-dry press. Here the mixed clay and grog is tempered with 8-9% water and fed to a powerful continous press which transmits a top and bottom pressure and finally ejects a finished brick ready for setting in kiln without further drying. This method is mainly used for making standard squares and arch bricks.

(2) Stiff plastic press. This method is used if a fairly large number of shapes is to be produced. The clay and grog mixture as before is passed through double shafted mixers where 15-18% of water is added, and is then continuously fed into an extrusion machine where a column of clay is cut to requisite weight and pressed to the requite size and shape, then dried on cars in tunnel driers.

(3) Hand moulding. Where only a few shapes are required, these are invariably made in this method. The clay-grog mix is prepared as in (2) with extra water added to give greater workability. This is thrown into moulds by hand, ejected, fettled, and dried on hot floors. This method is also used for large or complex shapes.

This group includes R. F. Robinson (Watford), F. J. Denny (Ipswich), J. Anderton (President, Eastern Junior Gas Association), R. Goose (Colchester), R. W. Hilham (Hon. Secretary of the Association), and Bernard Clarke, M.B.E. (Lincoln).

Drying is mostly done in tunnel driers, the hot air for which is drawn from the colling kilns.

Firing is accomplished in continuous burning kilns of the moving fire-stationary goods type for the normal fire-brick materials, but the super-refractories are still fired in intermittent kilns.

At the conclusion of the meeting members were invited to tea, following which Mr. BERNARD CLARKE expressed on behalf of the Association their thanks for a most enjoyable visit. He also took the opportunity of wishing Mr. P. K. Banks good health and happiness in his forthcoming retirement from active business with his company.

Melchett Medal for Dr. Hartley

A HIGH LIGHT of the annual luncheon of the Institute of Fuel, held at the Connaught Rooms, London, on Thursday last, was the presentation by the President, Dr. G. E. FOXWELL, of the Melchett Medal to Dr. HAROLD HARTLEY, C.B.E., who has done so much in so many ways to further, both by research and practical application, the better utilisation of fuel. Dr. Foxwell referred to the high scientific achievements and great administrative ability of Dr. Hartley, a Past President of the Institution of Gas Engineers and the recipient of the highest award which the Institution could bestow —the Birmingham Medal. Dr. Hartley was, in fact, the only person to hold both both the Birmingham Medal and the Melchett Medal of the Institute of Fuel.

The luncheon was attended by a large gathering of members, and there were many distinguished guests. Toast of 'The Institute of Fuel' was in the hands of the principal guest, Mr. GEOFFREY LLOYD, Minister of Fuel and Power, who spoke of great men of the past who had pointed to the seriousness of the smoke evil and the need for a more scientific and economic use of coal. In the new Elizabethan age the Institute of Fuel had great potentialities for usefulness and service to the nation.

Following response by the PRESIDENT, Sir JOHN CHARRINGTON proposed the toast of 'The Guests,' to which reply was made by Mr. H. F. H. JONES, M.B.E., Deputy Chairman of the Gas Council.

South Eastern Students Visit Mains

A PARTY OF STUDENTS from the South Eastern Technical College, Lewisham, who are also employees of the South Eastern Gas Board, recently toured the Edmonton works of R. & A. Main, Ltd., and Main Enamel Manufacturing Co., Ltd.

Mr. G. F. Claxton and Mr. O. Buxton, instructors at the college, accompanied the students, who will shortly be taking their finals in either the City and Guilds of London Institute Gas Technology examination, or the Institution of Gas Engineers Higher Grade Certificate in Gas Engineering (Supply).

To facilitate their studies, the tour was so arranged that the greater period was spent in viewing the operations of the foundry and enamel shop at R. & A. Main's factory and in the production of frit and colouring oxides in the subsidiary company's works.

At the completion of the visit, the party were entertained to tea in the staff canteen, during which Mr. Claxton thanked all concerned for an enjoyable and instructive tour.

Edinburgh Corporation Works Committee has agreed to a suggestion that local community associations should be asked to report street lamp failures in their areas, as the cost of regular official inspection would be considerable. When checks were made recently 300 gas lamps and 580 electric lamps were found to be out.

MIDLAND JUNIORS VISIT HUDDERSFIELD

ABOUT 50 members of the Midland Junior Gas Association made the long trip to Huddersfield on April 16 to visit the works of W. C. Holmes & Co., Ltd. The visitors were led by their President, Mr. D. J. Ward, and were refreshed from their journey, before making a tour of the works, at a luncheon given by the Directors, among whom were Mr. H. Whiteley and Mr. P. Rushworth.

The proceedings were informal, but Mr. F. Brian Holmes, Chairman and Joint Managing Director, expressed the company's pleasure at having the Midland Juniors as guests, and Mr. D. J. Ward replied in cheerful vein. Also present as guests were Mr. J. G. Tilley and Mr. H. Singleton, of the Huddersfield Group, North Eastern Gas Board.

The visitors then inspected the works. These have been established on the Turnbridge site since 1880 and have been gradually extended since that date and now comprise a complete general engineering works for the production of the class of cast iron and mild steel work used in the gas industry. The foundry is mechanised for general work and includes modern sand preparation plant with vibrators and sand slingers for mechanised moulding, and a laboratory for control purposes. Fettling castings is carried out in shot blast apparatus.

The Latest Machines

The machine shop is extensive, the latest machine additions being a Waldrich hydraulic planer to take jobs up to 16 ft. long, 6 ft. 8 in. wide and 4 ft. high, and a Schiess vertical borer for jobs up to 6 ft. dia., 5 ft. high.

A large welding shop is laid out chiefly for the manufacture of vessels and mains, this being equipped with a stress relieving furnace capable of handling vessels up to 12 tons weight and covering 12 ft. square cross section by 26 ft. long. This is used for the stress relieving of mild steel welded material which may be used in fuel gas streams under conditions where inter-crystalline attack may follow the over-stressing of welds. The stress relieving is carried out by raising the temperature of the finished vessel to about 450°C. for one hour, this ensuring that no trouble will follow from corrosion by the gas after erection.

In the tour a considerable amount of work in progress for various gas boards was seen. Among these were ammonia stripping stills, 'Multifilm' washers, gas heaters, detarrer casings, industrial catalytic sulphur removal plant and butane/air installations, Connersville and B.M. meters, air blowers, an exhauster and various inert gas generators.

A departure from this gas engineering work was provided by the products of the Holset Engineering Co., Ltd., associated with W. C. Holmes & Co., Ltd. This company specialises in the production of Holset shaft couplings and also the Holset inertia dampers. The former are flexible couplings in which the torque of the driving shaft is transmitted through broad faced rubber blocks to the driven shaft. The inertia damper consists of a ring member placed free within an external casing, the clearance between the ring and the casing being very small and filled with silicone fluid, the essential feature of this being that the variation in the fluid viscosity with changing temperature is very small. The damper casing is attached to the crankshaft of an internal combustion engine, the effect being that any torsional and critical speed vibration inherent in the crank shaft system is much reduced without any loss of power in the engine.

After the tour the visitors retired for tea, following which Mr. H. J. Reynolds (Wolverhampton) expressed his pleasure at meeting so many old friends and thanked the firm for its warm hospitality. The guests were speeded on their way by Mr. C. Cooper, Joint Managing Director, who pointed out that once again the proceedings proved that the juniors could manage very well without their seniors, but that this was not necessarily true in reverse.

Fuel Efficiency Exhibition

LARGER than the exhibition of 1951, comprehensive in its coverage of fuel and efficient and modern methods of consuming it, the 1953 Fuel Efficiency Exhibition to be held in November at the City Hall, Manchester, will bring together the leading organisations in this field.

A series of tableaux will show the contrast between the old and the new in domestic heating appliances, and on the heavy industrial side, an old fashioned boiler house will be compared with new instrumentation methods of easy and clean fuel control. Models of ancient and modern railway engines, British Electricity Authority models showing exactly what happens at a power station when peak loads are carried, and what to look forward to in new fuelling methods in the atomic age will complete this feature.

The exhibition, organised and presented by Provincial Exhibitions, Ltd., is sponsored by the Combustion Engineering Association.

Mr. T. Hastings, Manager of Omagh (Co. Tyrone) Gas Department, reporting to his Council on the modernisation of the works, estimated that an additional 144 street lamps would be required and the total cost of the scheme would be £11,350. There is a proposal to light the streets by electricity and Mr. Hastings stated that if the Council decided to retain gas lighting and especially if it increased the number of lights it would have to authorise a further expenditure of £10,000 on plant. A committee of the Council is to report.

The Second Annual General Meeting of the North of England Section of the Institution of Gas Engineers will be held at the Old Assembly Rooms, Westgate Road, Newcastle-on-Tyne, at 11.30 a.m. on May 7. Members' wives and ladies are invited, and arrangements have been made for them to visit Wills' tobacco factory during the afternoon while members have their business meeting and listen to Mr. G. E. Anderson's Chairman's Address. The day's programme will end with a social and musical evening from 6 p.m. to 8.30 p.m.

Scottish Association of Gas Managers

Spring Meeting at Peebles

THE Spring Meeting of the Scottish Association of Gas Managers was held on April 17 in the Peebles Hotel Hydro, the President, Mr. ROBERT COWIE, Hawick, welcoming a large attendance of members. It was very appropriate, he said, that they should be meeting in such a beautiful Border town, only 20 miles from Kelso, where, 92 years ago, the first recorded meeting of gas managers was held. It was from that meeting that the Waverley Association grew, continuing its separate existence until two years ago.

'We are,' said Mr. Cowie, 'within sight of Priorsfoot, where William Young spent his declining years. William Young did much for the advancement of the industry in days gone by and made a considerable contribution to the Transactions of the North British Association of Gas Managers, which Association, along with the Waverley Association, forms the basis of the new Association under whose auspices we now meet. We owe a debt of gratitude to the North British Association for instituting the William Young Memorial Lectures, which keep his memory green. Only yesterday we placed a wreath on his grave.'

The President said they had with them that day Sir Andrew Clow, Chairman of the Scottish Gas Board. The support and encouragement they received from Sir Andrew and his colleagues on the Board meant much to them. Also with them were Mr. J. T. Haynes, Senior Vice-President of the Institution of Gas Engineers, Dr. Hugh B. Nesbit, Principal of the Heriot-Watt College, Mr. J. S. Forrest, of the Ministry of Fuel and Power, Scottish Office, and one of their own members, Mr. Alex. McDonald, present in his capacity as Chairman of the Manchester Section of the Institution. In addition they were honoured with the presence of Provost A. P. Daniels, of Peebles.

Early History

Extending a welcome on behalf of the magistrates, councillors, and people of Peebles, Provost DANIELS said that Peebles gasworks were built in 1829, when coal was 11s. per ton and gas was supplied only for 10 months in the year. Four years later a full year's supply was available and in 1835 the output was 175,000 cu.ft. From 1837 to 1844 the works were operated by an ironmonger, who paid £51 annual rental, the consumers paying 13s. per 1,000 cu.ft. The make in 1853 was 736,000 cu.ft., rising to 903,000 cu.ft. in 1861, in which year the railway came to Peebles. In 1898 the Town Council acquired the undertaking for £11,000 and in 1905 new works were erected on the present site at a cost of £25,000. In 1929, their centenary year, a new Glover-West vertical retort plant had been installed, followed by a new holder.

Provost Daniels said he himself had been a banker in Delhi and had had the pleasure of meeting Sir Andrew Clow there. He had a great respect for the men who upheld the traditions of the Indian Civil Service and it was good to know that the great administrative experience which Sir Andrew had gained in India was being put to such good use in Scotland. The last occasion on which a gas managers' conference had been held in Peebles was in 1937, a Coronation year, and he hoped that their present conference, also being held in a Coronation year, would be most successful.

The PRESIDENT, after thanking the Provost for his welcome, referred to the loss sustained by the Association through the death of Mr. F. R. Mitchell, of the Lanarkshire Group. Mr. Mitchell, who was 52 years of age, was elected a member in 1931 and was President in 1950-51. At the time of his death he was an Honorary Councillor and was held in high esteem by all.

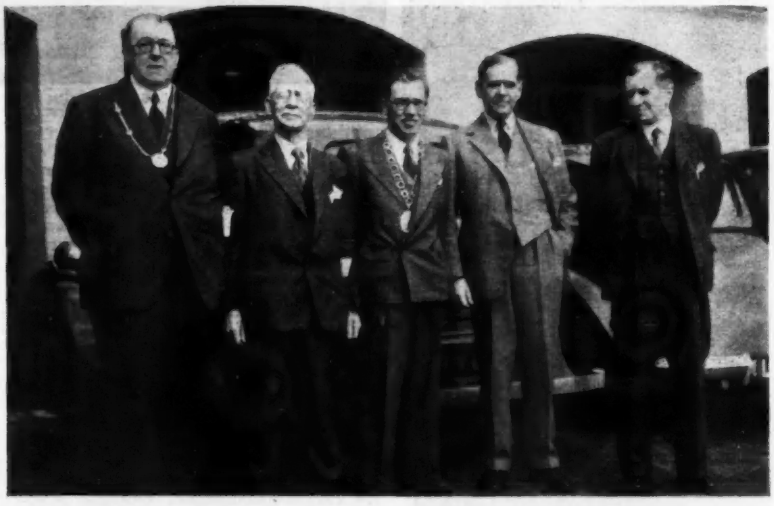
Sir ANDREW CLOW expressed his pleasure at being present. They would be hearing something about education from one who was a real expert on the subject. He would suggest that attendance at such a gathering was a real educational asset. Nothing added so much to learning as the exchange of ideas with one another. A good administrator depended not so much on his own knowledge as on other people's brains. He should be able to ascertain the opinions of other people even if they differed from his own. To share the experiences of other managers and other firms was valuable and he wished the conference all success. He was particularly glad to see with them that day their President's father, a President of one of the former Associations.

Expressing his thanks to Sir Andrew, the PRESIDENT said that in its service to members the Association was striving to be of real value to the industry. They were all earnestly endeavouring to play a worthy part in their own particular sphere of service.

Mr. J. T. HAYNES, Senior Vice-President of the Institution, said that owing to the Wales and Monmouthshire Section of the Institution having its meeting at the same time, it was impossible for Mr. G. E. Currier to be present and he had come north as his deputy. He congratulated Mr. Cowie on his election as President and expressed the hope that his year of office would be most successful. He brought good wishes from Dr. W. T. K. Braunholtz.

Thanking Mr. Haynes for his remarks, the PRESIDENT expressed appreciation of the welcome and friendliness received when attending meetings of the Institution Council.

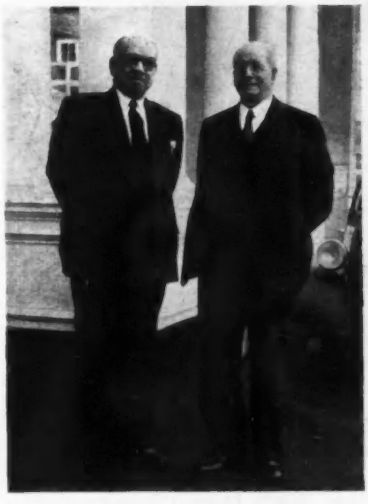
Introducing Dr. Hugh B. Nisbet, the PRESIDENT said that many former students of the Heriot-Watt College, Edinburgh, were present that day. In recent years, due to circumstances with which they were all only too familiar, the study of fuels, their use, behaviour, and cost, had become of paramount importance to every citizen and particularly to the gas engineer. In the east of Scotland no one had played a more important part in fuel education than Dr. Nisbet and they had all been pleased when he was appointed Principal of the College.



Left to right: *Provost A. P. Daniels, Mr. R. W. Cowie (father of the President), Mr. R. Cowie (President), Lieut.-Col. W. Thorburn, D.S.O. (Lord Lieutenant of the County), and Sir Andrew Clow (Chairman, Scottish Gas Board).*

Dr. NISBET, who gave as the title of his talk 'An Educational Investment,' said that education was a matter in which the Association took a very lively interest. 'The education scheme of the Institution of Gas Engineers is,' he said, 'well known to you all and that it provides a "ladder plan" which enables the young apprentice to proceed gradually to professional status by the various stages of qualification needs to be no more than mentioned. Only time will show whether or not this scheme will provide professional men of the calibre you require to maintain and advance the technical developments in your industry.'

'I have,' continued Dr. Nisbet, 'observed two trends in recent years regarding the selection of entrants to your industry: (1) The selection of apprentices is nowadays almost completely confined to those with Leaving Certificates or equivalent entrance standard; (2) it frequently happens now that men are selected with H.N.C. in other branches (mainly mechanical engineering) or with degrees (or equivalent qualification) in mechanical engineering. On the previous training of these men there is superimposed training in gas engineering and ancillary subjects which have been missed in the mechanical engineering schemes. If my surmise is correct then I would like to suggest a modification of the training provided for your "straight" gas engineering apprentices: (1) Select those with Leaving Certificates with passes in higher English, mathematics, science (physics and chemistry), and one other subject. (2) Give them one year's experience in the works, taking evening classes if they wish to do so in mathematics, physics, and chemistry to keep themselves abreast of latest studies. (3) Follow this with some form of sandwich course. The type will depend on numbers and location. It might be a three years' course with 30 weeks in each year spent at a university taking a degree course or in a technical college taking the college associateship course



Mr. C. Poulson and Mr. Ernest West.

in civil engineering. In technical colleges this course might be modified so that it can be a course in civil engineering for gas engineers. Alternatively, the course might be a four years' one with 20 weeks in each year with the same object in view—*i.e.*, degree or associateship in civil engineering. In the first case the three years' period of training could be followed by a further year's industrial experience. With the six months' sandwich course it might not be necessary to expect further industrial experience. The vacation periods in the main academic course would also be spent in the works and in each case, of course, a reasonable holiday period would have to be allowed.

'I think I could guarantee that the men so trained would have an adequate background of theoretical knowledge (at least equivalent to a university course) and I feel certain that you could ensure that the technical background should be equally well established during this period of training.

'You may enquire as to who would pay these men while they were attending these extended courses of full-time study. I would like to suggest that your industry should do so. As a nationalised industry what you spend is the country's money and in some ways it does not matter which pocket it comes from. Money spent as I suggest would, therefore, become a national investment in education. A feature of some importance in such a scheme is that the people so trained are most likely to remain in your industry for life. What is most important is that you should have a stream of adequately trained gas engineers coming forward who can ensure that your industry is maintained at high efficiency and continually examining the means of conserving the fuel resources of this country.

'I would also express the hope that you would send some of your apprentices to take courses in chemical engineering instead of civil engineering. Mr. Francis J. Curtis, a distinguished American President of the Society of Chemical Industry, was in Edinburgh last week and I had a word with him on the training of chemical engineers and the part they play in American industry. He said that one advantage which the well-trained chemical engineer had was that he could tackle any kind of engineering problem. He instanced the fact that during the war they had in the U.S.A. to use a considerable number of chemical engineers to undertake the tasks normally assigned to mechanical engineers.

'I would suggest that in the next 10 to 20 years the welfare and development of industries such as yours, which are basically chemical industries, will be proportional to the number of chemical engineers you have engaged in your technical departments. In planning your scheme of training on civil engineering for gas engineers you have gone quite a way towards training your personnel as chemical engineers, but not just far enough.'

The PRESIDENT expressed his gratitude to Dr. Nisbet for his address, and thereafter Mr. J. S. FORREST, Senior Scottish Officer of the Ministry of Fuel and Power, said he had been in Scotland for three years and had had frequent contacts with the gas industry. He regretted that he was leaving Scotland in the autumn because he had made many good friends North of the Border. Their industry was the last of the three great fuel industries to be nationalised, and the smoothness of the take-over had been remarkable. Gas managers had not become civil-service minded but they had shown great adaptability. As long as he was in Scotland he would continue to serve the industry as much as possible and he proposed to ask his successor to follow in the same lines.

After the presentation of prizes—the Cup winner, Mr. G. E. Jeffs, with the captain and members of the Golf Circle.

The PRESIDENT intimated that the Council had nominated Mr. James Hall, Glasgow, and Mr. Alex. McFadyen, Dumbarton, for Council vacancies, the election to take place at the annual general meeting. Thereafter he delivered his address (which is published on page 272).

Mr. ATHOL W. BROWN, Senior Vice-President, proposing a vote of thanks to the President for his address, said that if they referred to the records they would find that the President in 1920 was a Robert W. Cowie. Now, 33 years later, there would be recorded another President with the same name. The relationship had long been established, their vocation had followed a common course, and their qualities, interests, and outstanding services had earned for both the highest distinction the Association could confer upon them. They would congratulate the father that day on the distinction of his son, and commend the son for following with such success and singleness of purpose the example of his father.

Their President throughout his career had been prominent in the Councils of the Scottish gas industry and had never been slow to express his opinions, which were invariably very strongly upheld. In 1942 he was President of the Waverley Association and he had been a very interested party in the amalgamation of that Association with the North British Association. He was the author of several papers, in which he had dealt

with his favourite subject, 'Sales and Service.' In his presidential address he had adopted a new pattern and had surveyed the outlook and work of a gas manager today. He had dealt with the impact of nationalisation on the functions and responsibilities of the district manager, but one felt that his views did not convey the same positive conviction which one had come to associate with him.

The President places a wreath on the grave of William Young in Peebles Cemetery.

'I feel no uncertainty in disagreeing with certain of his views,' said Mr. Brown, 'but there is no doubt that all members, irrespective of position, would do well to give them thought and to consider where they stand in relation to the ideal. Nationalisation is an ideal. It is a challenge to the best in us all. Mr. Cowie has threaded through his address issues of moment to district managers, and his presentation of these issues is in the best tradition of diplomacy. His example, therefore, causes me to suppress my already suppressed feelings on this subject.

'We would all agree with Mr. Cowie when he says that "the most powerful incentive to efficiency is personal pride and satisfaction in being equipped to do a job well and having something to show for it at the end of the day." In logical sequence it follows that the individual of capacity and greatest potential value feels more acutely the phenomena of frustration in a rigid organisation and eventually he is forced back to the common level, his confidence shaken, his spirit destroyed, and his value lost. This is an ever-present factor which our administrators would do well to note, as there exists a very real danger of a levelling down in capacity and initiative. Those members trained in the pre-war era absorbed from their mentors an enthusiasm for their job. The keen competition for position maintained their enthusiasm and by virtue of the experience they are less likely to become apatheic. But the effect on the next generation could well be disastrous.'

Now was the time, continued Mr. Brown, for extension and development of a sales organisation on a scale never previously contemplated, and there should be no hesitation in going outside the industry for top level executives. The district manager today might retain a sentimental attachment to his works, but from experience he had observed that he was all too conscious of competition, very sensitive to decrease in gas sales, and was invariably doing his utmost to maintain public contacts in the limited time available after he had done the jobs he must do. There was at his disposal technical assistance for development of works plant and distribution systems, but in the field of sales, ill-equipped, he more often battled alone. Here there was much to do. Excuses and assumed obstacles must be brushed aside.

Seconding the vote of thanks, Mr. J. FORD, Inverness, Junior Vice-President, said that in the long history of their Association it had happened several times that the son of a former President occupied the chair. Never before, however, had it been occupied by one who was of the fourth generation of gas managers. They had had an address which was bound to provoke varying reactions in the minds of those who had heard it. The events of the past four years had been so revolutionary that it would have been surprising if they had all met with complete approval. To managers accustomed to independence of thought and action the mental readjustment required under the new organisation had not been easy. Nevertheless, it was to their credit and in keeping with the high traditions of the industry that they had pursued with zeal policies and instructions the reasons for which were not always fully apparent to them.

Incentive could take many forms, whatever their position, and one of the greatest incentives towards the effective execution of policy was to understand the reason for it. Although they might not approve they could appreciate that, as units of a large organisation, central control had to take a more comprehensive view of every problem than would be taken by those in a narrower sphere.

That nationalisation had improved 'their professional practice might not be true in every case, although they knew that it had done so in many places. The plight of many of their smaller undertakings would be grim today had they been unable to share in the prosperity of their larger neighbours. The most hardened individualist could not deny that there had been opened up tremendous new opportunities for service, and the industry in Scotland had been placed in a stronger position than ever before.

In the latter part of his address the President had stressed the challenge confronting them in selling their service. While the main burden of that would continue to fall on the local manager and his staff he felt strongly that much expert assistance would be desirable, and those who were in the smaller undertakings looked to the central organisation to provide it. No matter how small the undertaking it was part of the Scottish Gas Board and had to maintain a really high standard in all matters of publicity and sales effort. The same economic factors which were now retarding their own progress were also affecting their competitors. They could not afford in any part of their service to be content with a standard in any way inferior to that of their competitors.

Mr. R. Johnson, Mr. B. McLusky, and Professor H. B. Nisbet (President of the Heriot-Watt College, Edinburgh).

Luncheon Proceedings

At the luncheon the toast of 'The Gas Industry' was proposed by Dr. H. B. NISBET, who said he was glad to see there that day many of the students who had passed through his hands in the last 30 years. The efficiency with which the industry had tackled the problem of meeting the demands of consumers for gaseous and other fuels of high quality and dependability in the face of the difficulties caused by inadequate quality and insufficient quantity of coal, coupled with the work accomplished by the industry in the way of research and the development of appliances of increasing utility, was worthy of the highest praise. He did not propose to elaborate the point because all present would be aware of its truth and would take a conscious pride in the part they played in the service of the community.

In the near future it was almost certain that they would be called upon to play a major part in the further conservation and still more efficient utilisation of the country's fuel resources.

Some of them regretted that the Ridley Committee had been unable at least to give pointers as how that had to be accomplished.

Acknowledging the toast, Mr. J. T. HAYNES, Vice-President of the Institution of Gas Engineers, recalled that a year ago he had given an address to the Scottish Juniors, when he had received a fine welcome. The Junior Vice-President of the Institution had had the same experience only a few weeks ago. Their great old industry had a reputation for over 150 years of service to the community. They were called a public utility, sharing that designation with the suppliers of electricity, water, and other commodities. He could not understand why gas, electricity and water should be singled out as public utilities when the supplies of bread, milk, and meat, for some reason were not included in that description. To his mind, gas shared with water and food the distinction of being one of the necessities of modern life. Reference was often made in their industry to the millions of tons of coal used, millions of therms produced, the number of appliances sold, but he was personally much more impressed by the fact that the industry employed 150,000 people, both men and women, all imbued with the spirit of service. The gas industry was one which could make that claim.

Pride in the Industry

When gas undertakings were springing up like mushrooms all over the country, the profit motive was the driving force, but with the passage of years that motive had given place to something more important. There was, for example, pride in the industry itself. There was pride of craftsmanship which began to take shape in the industry 90 years ago or more with the formation of associations such as their own, developing into the Institution to which many of them belonged and owed allegiance. The Institution had received its Royal Charter 25 years ago. More recently it had been honoured by Royal patronage and they were proud to have the Duke of Edinburgh as one of their honorary members. As years passed there had developed the idea of service to the community, taking physical shape in the B.C.G.A. formed 40 or 50 years ago. That organisation came into being largely through a Scot, Sir David Milne-Watson. A sense of loyalty to colleagues brought into being the Federation of Gas Employers with which many of his own generation had such happy years of association. These had been merged in a unified industry in the Gas Council and the twelve area boards.

Mr. Cowie had mentioned the growing feeling that after the first period of change and doubt and worry they now felt that co-ordination and centralised direction, through service to the consumer and loyalty to one's colleagues, were leading the industry into wider fields. They had every reason to be proud of the gas industry. Mutual and generous appreciation of the Gas Council and the Institution would give the industry an urge it had never had before.

The initiation of their great industry had always been associated with the name of William Murdoch, a Scot who had to go to England before he could put his ideas into practice. Another Scot, Sir David Milne-Watson, also had to go to England to put his ideas into practice. He recalled that 30 years ago he had met another Scot at a meeting which gave rise to the Institution's education scheme. Both of them had suggestions which were unacceptable to the others, but they had seen their ideas incorporated in the latest development of that scheme. His old friend had had to step aside to make room for others, but in the name of the Institution and their great industry he wished to pay tribute to Mr. David Fulton for all that he had done. He had expressed his mind as a dour Scot on many occasions and had refused to accept without qualification the views of others. Nevertheless he had always loyally accepted any decision reached, although sometimes putting his own interpretation on it. The Scottish influence on the industry was to be found everywhere.

Mr. ALEX. MCDONALD, Chairman of the Manchester Section of the Institution, proposed the toast of the guests, Provost FRASER, of Hawick, in reply, congratulating the Association on having chosen a Hawick man as President. He had known Mr. Cowie for many years and esteemed him for his ability and kindly ways.

Mr. D. D. MELVIN (Member, Scottish Gas Board) proposed the health of the President. Robert Cowie, he said, was the fourth generation of gas managers in his family. His great grandfather, Peter Watson, was at Stirling, his grandfather, Robert Cowie, was at Cambuslang and Tillicoultry, and his father was at Lockerbie, Dalkieth, Port Glasgow, and Hawick. They were delighted to see R. W. Cowie, Senior, with them today and shared his pride in knowing that his son had filled his position as manager in Hawick in such an able manner and had followed in his footsteps, first as President of the Waverley Association and now of the Scottish Association. They knew of his unbounded enthusiasm for his job and for the industry, but he also found time for innumerable community interests. It was a happy coincidence that that day was their President's birthday.

Mr. COWIE briefly responded, the proceedings then terminating.

Golf Circle

The Spring Meeting of the Scottish Association of Gas Managers Golf Circle was held over the course of the Peebles Golf Club on April 16. The following were the prizewinners:—

Winson Scott Cup: Mr. G. E. Jeffs, 93 – 17 = 76.

Section 1.

G. E. H. Keillor	87 – 10 = 77
J. H. Fulton	85 – 6 = 79
D. Beavis	85 – 6 = 79
L. Fletcher	88 – 8 = 80

Section 2.

G. E. Jeffs	93 – 17 = 76
J. McPherson	99 – 14 = 85
A. McFadyen	102 – 17 = 85
W. S. Johnson	102 – 16 = 86
W. Q. Foster	104 – 18 = 86

Visitors.

J. S. Ford	82 – 9 = 73
W. Gray	85 – 11 = 74
W. T. Wright	91 – 10 = 81

The Captain of the Golf Circle, Mr. W. C. Campbell, presented the prizes to the winners, and intimated that 51 Circle members and 14 visitors had taken part in the outing. The Captain also extended a welcome to the visitors, who included Mr. J. T. Haynes, Vice-President, Institution of Gas Engineers, and Mr. Francis Drake, Captain, S.B.G.I. Golf Circle. Mr. Drake returned thanks on behalf of the visitors.

Film Show

Members of the Association were entertained to a film show during the evening of April 16 at Peebles Hydro. The films, which were shown by courtesy of Mr. Ernest West, covered the Association's activities at the annual general meetings of 1938 at Largs, 1951 at Ayr, and 1952 at Largs. The beautiful colour films revived many happy memories of excursions down the Clyde, and the many excellent shots of the well-known beauty spots showed in no small measure Mr. West's skill with a cine-camera. Mr. C. Poulson was projectionist.

A vote of thanks to Mr. West and Mr. Poulson was moved by Mr. Cowie, President of the Association, who said he hoped that it would be possible to arrange a repeat performance for the ladies at the September meeting.

Change of Address.—International Combustion, Ltd., have moved their Leeds office from London Assurance House, Bond Place, Leeds, to new premises at National Employers House, Quebec Street, Leeds 1. The telephone number will remain as before, Leeds 33274.

B.C.M.P.A.—The annual general meeting of the British Chemical Plant Manufacturers' Association was held at Grosvenor House, London, W.1, on April 15, followed by the annual dinner at which the principal guest was Sir Harold Hartley, K.C.V.O., C.B.E., M.C., D.C.L., F.R.S. At the meeting the retiring Chairman, Mr. H. V. Yorke, of Bennett, Sons & Shears, Ltd., was re-elected.

The National Coal Board is to carry out an important development scheme at the Monkton coke and by-products plant at Jarrow which will double the size of the present plant. When the matter was reported to the Town Planning Committee of Jarrow Corporation, fears were expressed that fumes and smell from the plant might interfere with the health of people living in nearby houses. It was pointed out that the Corporation could only object to the scheme on health grounds, and it was decided to refer the matter to the Corporation Health Committee.

First Aid.—On March 28 at Shrewsbury the West Midlands Gas Board's annual first aid competition for the Shropshire division was held under the auspices of the St. John Ambulance Brigade. The final placing of the teams was as follows: 1, Shrewsbury (296 marks); 2, Ludlow (286 marks); 3, Wellington (265 marks); 4, Market Drayton; 5, Bridgnorth (249 marks). In the team test the Ludlow team was adjudged the best, with Market Drayton second and Shrewsbury third, but in the individual tests Shrewsbury gained the lead, and ultimately won the competition.

INSTITUTION OF GAS ENGINEERS

Midland Section's Third Annual Meeting

THE third annual general meeting of the Midland Section of the Institution of Gas Engineers was held at the Queen's Hotel, Birmingham, on April 24. The Chairman, Mr. J. E. Wakeford, M.B.E., Birmingham Divisional General Manager, presided over the first half of the proceedings and inducted his successor, Mr. W. Macnaughton, Deputy Divisional General Manager, Wolverhampton, and General Manager and Chief Engineer of the Wolverhampton District. Mr. Wakeford, at the outset, referred to the sudden death the previous day of Mr. George Helps, who recently retired from the position of engineer and manager at Nuneaton. Mr. Helps had apparently been in good health and was in his garden when he had a heart attack and died immediately.

Mr. JOHN CORRIGAN, Hon. Secretary, reported appoligies for absence from Mr. Henry F. H. Jones, Deputy Chairman of the Gas Council, Dr. Harold Hartley, Chairman of Radiation Ltd., Professor F. H. Garner, Birmingham University and a part time member of the West Midlands Gas Board, and the chairmen and secretaries of a number of district sections.

The annual report and statement of accounts were adopted.

New Officers

On the proposition of Mr. FRANCIS DRAKE, seconded by Mr. F. J. EDMONDS, the meeting confirmed the election of the following officers whose names had been recommended by the Management Committee: *Chairman*, W. Macnaughton (Wolverhampton); *Senior Vice-Chairman*, C. C. Wood (Sheffield and Rotherham); *Junior Vice-Chairman*, A. Allen (Warwickshire Division); *Hon. Secretary*, J. Corrigan (Northampton); *Hon. Treasurer*, J. H. Wainwright (Halesowen); *Auditors*, W. H. Blundstone (Hereford) and L. H. Thomas (Oldbury); *Ordinary members* of Management Committee, 1953-56, F. L. Atkin (Birmingham), F. H. Bate (Wolverhampton) and C. H. Woodfine (Shifnal).

On the proposition of the CHAIRMAN, seconded by Mr. F. H. BATE, Mr. Macnaughton was nominated as district representative on the Council of the Institution of Gas Engineers.

The SECRETARY said the Management Committee had submitted the name of Mr. Wakeford for nomination as an ordinary member of the Council of the Institution for 1953-56 and on the proposition of Mr. C. M. D. BELTON (Shrewsbury) the meeting warmly endorsed the nomination.

Education Report

Mr. H. R. HEMS reported on the work of the Midland District Education Committee which had met only once during the year, though it was represented either by its chairman or secretary at three of the four meetings of the Institution Education Committee. The main matters under consideration had been (1) the future constitution and functions of district education committees; (2) a proposal made to the Institution Education Committee that a certificate should be awarded for successes at an intermediate stage in the City and Guilds Technology in Gas Manufacture course, and (3) a request from the Institution Committee for views on the introduction of the subject of training and management into the Institution schemes of training and examination.

On the constitution and functions of district committees it should be noted that whereas district sections of the Institution had been represented by four members the number was now reduced to three. The reduction in representation also applied to junior gas associations. On the other hand membership now comprised the education officer or other representative of each area board within whose territory the district committee functioned. Provision was also made for membership by representatives of technical colleges. The duties of the committees were to give advice to students when required, or where appropriate to collaborate with area board officers in giving such advice; to deal with matters which might be referred to them by the Institution Education Committee or by the area board; to report annually to district sections and to junior gas associations on the educational activities of the Institution, and to do all in their power to further the cause of gas education in the districts.

No Course for Key Men

Regarding the proposals made by the Midland District Commitee for an intermediate certificate in the City and Guilds Technology (Gas Manufacture) examination, Mr. Hems said this was intended to provide a suitable course of formal education for key men such as valve men, water gas operators, heat attendants, etc., particularly for such men employed on very large gasworks. When the proposal was discussed by the Education Committee at its July meeting it was found that there was no national support for such a certificate. The City and Guilds representative, however, undertook to consider the possibility of initiating a course experimentally in Birmingham, but finally the City and Guilds Institute found itself unable to recommend the implementation of such a course. With regard to courses under the old regulations the point had now been reached at which the last of the Higher Grade examinations would be held at the end of the present month. Anticipating that there would be a considerable number of failures the Education Committee had prepared a letter for the guidance of unsuccessful candidates who made enquiries as to the best course for them to pursue.

The CHAIRMAN thanked Mr. Hems for his report and expressed appreciation of the good work done by the Education Committee over a considerable number of years.

The question of the election of three members of the Education Committee (there being four at present) was deferred for a later meeting.

The CHAIRMAN expressed appreciation of the generosity of members towards the Benevolent Fund of the Institution of Gas Engineers during the past 12 months. They had set out to make a special effort on behalf of the Fund, not merely to provide something for their unfortunate colleagues and dependants which would enable them to live but to give them something which would make life worth living. It was entirely a mistake to suppose that State benefits could take the place of the Benevolent Fund, and as Chairman of the Section he was proud of the fact that during the past year they had not only given 50 guineas from the Section but they had also raised £62 by collections.

Following consideration by the Management Committee he was going to ask the Section, particularly in this Coronation Year, to increase its donation from 50 to 75 guineas.

Mr. W. R. BRANSON seconded the proposal to increase the donation to 75 guineas and it was unanimously approved.

Mr. C. F. W. RENDLE (Worcestershire and Herefordshire Division), said that as time passed the need for the Fund grew no less, and he congratulated the Chairman on his enthusiastic endeavour on behalf of the Fund during the past year. Time was when the number of contributors among members of the Midland Section was head and shoulders above the percentage in any other section in the country. He did not know the present figures in the Midland Section but he was alarmed to find that the percentage of Institution members contributing to the Fund had fallen throughout the country. That, he suggested, was due to the fact that newcomers, mainly the younger members, had not been fully acquainted with what he regarded as one of their main responsibilities, and he hoped every effort would be made to impress on them the desirability of supporting the Fund.

Mr. G. E. CURRIER, President of the Institution and Chairman of the Benevolent Fund Committee, in thanking the Section for its decision to increase its donation, said the money was needed and would be carefully spent. He paid tribute to Mr. Wakeford and said he knew no-one in the industry who during the past two or three years had worked harder for the Fund. He hoped all the members would be able to come to the annual meeting of the Institution for which a varied programme had been arranged.

Induction of Chairman

Mr. WAKEFORD then inducted Mr. Macnaughton as his successor. He had, he said, taken over the office from a Scot (Mr. A. Tran) 12 months ago and he was now handing over the Chairmanship to another Scot. Until his own return to the Midlands in 1945 he did not know Mr. Macnaughton very well, but during the past eight years they had come into contact a great deal they he had learnt much of his sterling qualities. Despite his youthful appearance and his bright personality he had been in the industry 43 years. He started his career in the gas industry at Coatbridge

and then went to Armadale, and he joined the hard scool at Coventry in 1917 under a past chairman and very respected friend and colleague of the old Association who was present that day—Mr. Percy Langford. He was appointed deputy works superintendent at Wolverhampton in 1919 and later on he was appointed chief engineer. Shortly before nationalisation he was appointed to the senior post of general manager and chief engineer at Wolverhampton.

It was some 20 years since Mr. Macnaughton was President of the Midland Junior Gas Association. He had many outside interests and was President of the Wolverhampton Engineering Society two or three years ago; he was a keen Rotarian and his hobbies included fishing and gardening.

Before handing over to one who they all felt would fill the best traditions of the office he desired to express his thanks for the kindness, consideration, and helpfulness he had received from all the members of the Section. He also expressed his gratitude to Mr. Corrigan as Secretary, to whom he said the Section owed a great debt.

Mr. MACNAUGHTON, in taking the chair, said his first duty was to thank Mr. Wakeford for the work he had done during the past year. The Section would remember him for three especial reasons, first, the excellent Chairman's Address which he gave them last April; secondly his wonderful personality and his kindly words to all the members; and thirdly the excellent way he had conducted all the meetings he had attended. He hoped to have the pleasure in the near future of presenting him with a memento of his year of office, but he had not yet intimated the form he wished it to take.

A Stimulating Address

Mr. MACNAUGHTON then delivered his Chairman's Address, which will be published in a later issue of the *Journal*.

Mr. C. C. WOOD, Senior Vice-Chairman, in proposing a vote of thanks to the Chairman, said he was the fourth Chairman of the Section, successor to the old Midland Association, and the third member from Wolverhampton to hold the office. In 1886 the President was Mr. John Ammon; 56 years later Mr. A. H. Cranmer held the office, and now Mr. Macnaughton was upholding the tradition. He could not help feeling that at the present time there was a reluctance on the part of members to express their views in public. It was probably a passing phase, and he hoped it would pass. He was not going to discuss the Chairman's Address. Broadly speaking it gave the position of the gas industry as Mr. Macnaughton saw it, with particular reference to coal, coke, and gas. In their quest for constant calorific values, constant pressures, and other ideals they were at the mercy of coal supplies, but he was impressed with the Chairman's reference to the great wealth of other resources available to them in these days—scientific, engineering, accounting, and legal—and he was reminded of those famous words when this country was hard pressed during the war—give us the tools and we will finish the job. Today we had the tools, and he was confident that the members of the Section would support Mr. Macnaughton in getting on with the job.

Mr. A. TRAN, Past Chairman, in the absence through illness of Mr. A. Allen, the new Junior Vice-Chairman, seconded the vote of thanks for what he described as a most inspiring and stimulating address. If he were asked to give it a title it would be simply 'Pointing the Way.' Mr. Macnaughton covered a wide field in a comparatively short address.

Mr. MACNAUGHTON briefly replied and gave preliminary details of the summer meeting, to be held at Wolverhampton on June 26, at which he hoped for a large attendance of members and their ladies.

A collection taken during the meeting on behalf of the Benevolent Fund realised £14 7s. 6d.

Luncheon Speeches

The meeting was preceded by a luncheon at the Queen's Hotel at the invitation of the West Midlands Gas Board, at which Mr. G. le B. Diamond, Chairman of the Board, was joined by Mr. Sydney Smith, Chairman of the East Midlands Board.

Mr. MACNAUGHTON proposed the toast of the West Midlands Board and welcomed the guests, among whom he particularly mentioned Mr. G. E. Currier, President of the Institution, accompanied by Dr. W. T. K. Braunholtz, Secretary, friend and philosopher of all members of the Institution; Mr. D. E. D. Kennedy, Mr. A. H. Pinder, and Mr. A. N. Dodson, from the Ministry of Fuel and Power; Mr. F. C. Vokes, Chief Engineer of the Tame and Rea Drainage Board; Mr. S. V. Lancaster, Auditor to the West Midlands Gas Board; Mr. F. Cureton, Secretary, and Mr. R. Davis, Chief Accountant of the Board. The West Midlands Gas Board was organising, developing, and would ultimately put into effect a public service second to none in this country, and the members of the Midland Section of the Institution were carrying out their duties to the best of their ability. They appreciated the keen interest which Mr. Diamond took in their welfare and they were grateful to him and the Board for their present hospitality.

Mr. G. LE B. DIAMOND, Chairman of the West Midlands Board, in replying to the toast, said the Board was deeply indebted to all its officers for the loyal support it had received since nationalisation and for the tremendous efforts which all of them had put in to improve the efficiency of the Board's working. For the year just ended the Board attained a thermal output of 78.6 therms per ton of coal carbonised. It was true that it inherited a large amount of vertical retort plant and would therefore expect to get more therms per ton because of the natural benefit of steaming, but 78.6 for the whole of the area, taking the inefficient works with the efficient, was a very high figure. Had the Board inherited a very large number of horizontal retort installations it might have expected a thermal return of about 73 or 74, which would have been good going, but to have got 78.6 meant a difference of somewhere about a million tons of coal a year, which was equivalent to between £3.5 and £4 mill. in purchasing price of coal.

President's Early Training

Mr. G. E. CURRIER, President of the Institution, proposed the toast of the Midland Section, coupled with the name of Mr. Wakeford. He recalled that he received his early training in the Birmingham Gas Department and was at one time a member of the Midland Junior Gas Association—he was not good enough for the senior association. The training he received in Birmingham and the help he received from the Midland Juniors had always stood him in good stead, and he was very grateful. They had always had pioneers in the gas industry in the Midlands, and the Institution was grateful for the fact that Mr. Hawthorn was Chairman of the board of examiners for the Institution examinations. He looked forward to the paper which Mr. Hawthorn was to give at the annual meeting of the Institution in London.

They appreciated the work Mr. Hems had done as Chairman of the Industrial Gas Development Committee and Chairman of the Midland District Education Committee. They had in their balance sheet an item headed 'Mixed Assets'; he suggested that the Section's current assets were the talents and experience and ability of all its members. In the West Midlands 50% of the gas sold was used in industry, with a consequent reduction in atmospheric pollution, particularly in the area of the Potteries. Strange as it might seem, he had found that taking an average over the five years from 1944 to 1949 the deposit of solids per sq. mile was only 18.8 tons per month in the Stoke-on-Trent area against 28 tons in Leeds.

Joint Meetings

The Midland Section was doing well to have joint meetings with other organisations and with the Institute of Sewage Purification. The Institution was particularly gratified that the Chairman of the West Midlands Gas Board had accepted the position of Chairman of the Effluents Committee of the Institution. In the West Midlands they had enthusiasts for dealing with the big problem of effluent disposal; he could only hope for the sake of their families that they did not become too immersed in the subject. He appreciated the generous support which the Section had given and was giving to the Benevolent Fund. Although there had fortunately been no great increase in the number of recipients there was need for increased grants, and they acknowledged with gratitude the help received from the Midland Section.

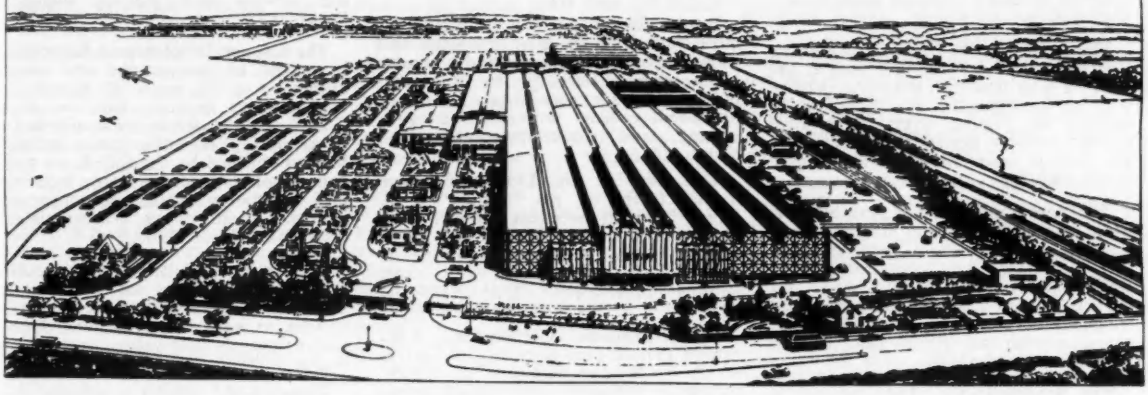
This was Coronation Year, and they were honoured by the fact that the Queen and the Duke of Edinburgh had honoured the Institution. They felt that the fact that the Royal Family had so recognised the Institution would be a spur to the members to further effort. They should try to recapture some of the spirit of the first Elizabethan era, the spirit of adventure and not of frustration. He paid tribute to the West Midlands Gas Board for its whole-hearted support of the Midland Section and of the Midland Junior Gas Association. Mr. Wakeford had been a very inspiring leader during the past year, and he wished Mr. Macnaughton a successful time in the coming year.

Institution's Independence

Mr. J. E. WAKEFORD, responding, said that as a native of the Midlands like himself, it was appropriate that Mr. Currier should have joined that gathering. The only difference between the two of them was that he (Mr. Wakeford) left the Midlands at the age of two, but in more mature years came back, while Mr. Currier left at the age of discretion and

(*Concluded on p. 268.*)

BRITISH INDUSTRIES FAIR



'GAS in the Non-Ferrous Metal Industries' is the theme of the Gas Council's stand at the British Industries Fair, Castle Bromwich, this year. The widespread use of gas in these industries, for a large variety of processes, is due to the certainty and ease with which it can be controlled. The processes demonstrated and illustrated on the stand include die-casting, degreasing, melting, soldering, brazing, hot brass stamping and steam raising. The exhibit includes a new bale-out furnace, a melting furnace with a new type of air-blast burner, and a new hot brass stamping furnace.

Dual Burner System

The bale-out furnace (Thermic Equipment & Engineering Co., Ltd., is shown in operation. It includes a pre-heating compartment, built into the waste gas flue of the furnace, enabling the make-up billets to be pre-heated, and resulting in a greater output of work per hour and in fuel saving, output being increased by 10% for the same gas consumption. Its dual burner system gives longer life to the crucible, and increased efficiency in gas consumption and in maintenance. Thermic 'Eddy Ray' gas burners are easily controlled to give perfect combustion with no possibility of back-firing. The furnace is well insulated and has a heavy robust casing, which will stand up to very hard usage.

The same group of exhibits includes a melting furnace (Nu-Way Heating Plants, Ltd.), designed to give increased economy in fuel consumption by ensuring that, once the burner has been set, the air-gas ratio will remain substantially constant over the turn-down range. As the average furnace operator is not sufficiently experienced to ensure that the correct ratio is maintained when adjusting both gas and air, it has been found that considerable economies are obtained by ensuring this constant ratio. The initial setting is made with the assistance of flue gas analysis apparatus.

The Nu-way burner is of compact design, with a circular flange for bolting to the furnace plate or brickwork so that it may be turned to receive air and gas pipes from any convenient direction. The burner does not need high air pressures, about 14 in. W.G. being usual. The flame may be seen in an inspection window and the burner is easy to clean and maintain.

Special attention is paid to furnace insulation, with resulting economy in fuel use, and comfort for the controller since radiation is reduced to a minimum. The casing is of electrically-welded mild steel plates, lined with insulating bricks. Cover tiles simplify relining and repairs. The combustion chamber is especially shaped for economical operation.

Die-Casting Machine

The die-casting machine shown is the Kippcaster 2158 model of William Coulthard & Co., Ltd. It is ideal for the production of small zinc, lead or tin alloy pressure die-castings and can be run continuously, many machines working 24 hours a day. The machine requires only a single operator, and is fully pneumatic with an air-operated metal plunger for forcing the metal into the dies. Multi-cavity dies are used for small parts, giving a high output of pieces per hour.

1953 EXHIBITS REVIEWED

A demonstration of electro-gas brazing equipment has been arranged by the Monitor Engineering & Oil Appliances, Ltd., the equipment being that of Standard Telephones & Cables, Ltd. It is for the purpose of mechanising production brazing of standard assemblies for Monitor blowlamps and pressure stoves. Alternative burners are available to suit the particular requirements of the process, either with flat, chisel-pointed flames for local heat, or with pin-point or fish-tail flames. This type of equipment will, it is expected, be capable of extension so that eventually the tedious hand-torch methods will become obsolete.

Hot brass stamping furnaces of Universal Furnaces, Ltd., and William Allday & Co., Ltd., are also shown. The former is a new model which is on view for the first time. Two Allday models are shown.

The de-greasing and steam raising section includes the washing plant of the Edward Curran Engineering Co., Ltd. It is designed for the washing and degreasing of metal parts and components, either individually or in baskets, and it can be installed in an assembly line so that parts are continuously discharged, or it may be loaded and unloaded by hand. The normal speed of 1s. per minute gives a two-minute wash of components, but this can be varied by altering the size of the sprocket on the driving shaft or, if desired, by the fitting of an infinitely variable speed drive. The liquor is heated by six immersion gas-fired tubes, the temperature being thermostatically controlled, and a governor and safety cut-out fitted.

A degreasing tank (Dowson & Mason Gas Plant Co., Ltd.) and a steam boiler (Controlled Flame Boilers, Ltd.) are also included in this section.

Other exhibits in the soldering and brazing section are a continuous brazing furnace, with atmosphere plant (Incandescent Heat Co., Ltd.) and a brazing hearth (A. H. Wilkes & Co., Ltd.). A holding furnace of 200 lb. aluminium capacity (Franklin Furnaces, Ltd.) is included in the melting and die-casting section.

In accordance with our usual practice we publish on the following pages an alphabetical list of exhibits which we believe will be of interest to our readers. The firms mentioned all have some connection, direct or indirect, with the gas industry, and particular prominence has been given to new designs and applications. The ten firms which constitute the gas section at the Fair have been included in this general review, since it was felt that no useful purpose would be served by dealing with them separately. For those intending to visit the Fair we have given stand numbers so that this review can be used as a useful guide to items of gas interest.

B.I.F.—The Trade Exhibits Stand by Stand

Acme Wringers, Ltd., offer a stand well up to their usual high standard. Both their hand operated and power operated domestic wringing machines are displayed to advantage. *Stand A.415.*

The Acru Electric Tool Manufacturing Co., Ltd., show for the first time at the B.I.F. a high precision engineers' square with an incorporated dial clock, which enables the angular error to be read directly in thou. per ft., thus eliminating the tedious insertion of feeler gauges. *Stand D.105.*

The Aerograph Co., Ltd., exhibit their usual impressive range of stationary and portable air compressors, spray guns, air filters, pressure feed containers, water wash spray booths, ducting, etc. Of particular interest is the JGA gun which, weighing only 22 oz., gives first-class spraying with all classes of finishing material. *Stand D.509.*

The Aeromatic Co., Ltd., are rightly noted for their specially designed burners. The full range of these are to be seen on their stand—not only the Hypact burners, but special purpose burners for industrial and domestic uses. Stainless steel burners are on show, as well as gas injectors and gas soldering irons. *Stand D.542.*

Astral Equipment, Ltd., offer their well-known built-in and table model 1½ cu. ft. domestic refrigerators. Measuring only 24¼ in. by 22¼ in. by 21¼ in. and weighing but 60 lb., it may be placed on a table top or shelf, on a stand which can be supplied, or hung on the wall. It is claimed that the Astral opens the door to the great mass of families whose kitchens could not accommodate the larger more expensive models. *Stand C.108.*

Autocontrol Boilers, Ltd., exhibit their Vertex gas-fired boilers for central heating and direct hot water supply. Of steel construction, these boilers are fully automatic, and are supplied complete with thermostat, flame failure device, and clock control. *Stand A.600.*

C. R. Averill, Ltd., makers of Avarc silica-graphite paints, show their products to good advantage. In addition to the paints which are well-known for their ability to protect iron and steelwork, Avarc high gloss and coach finishes for industrial and decorative uses and graphite specialities, including greases, compounds, and graphite for all purposes, are shown. *Stand C.202.*

B.V.C. Industrial Constructions, Ltd., speicalists in flue dust removal, exhibit their various industrial vacuum cleaners and ash sluicing plant. Four types of product are represented: Industrial portable vacuum cleaners, fixed central installations, boiler flue dust removal plant, and pneumatic and mechanical handling plant. *Stand D.203 and 102.*

Bell's Asbestos & Engineering, Ltd., exhibit asbestos fire protective equipment, thermal insulation, packings and jointings, silastic and other asbestos specialities for aircraft and industrial use, steam valves and fittings, flow control valves for solids, and jointing compounds. *Stand D.511.*

Braby, Frederick & Co., Ltd., exhibit typical examples of fabricated plate and sheet metal work, steel drums, perforated metals, tanks, cisterns and cylinders, galvanized rooflights and skylights, steel barrows, culverts, industrial aluminium holloware, and perforated cable plates *Stand B.517 and 416.*

Bratt Colbran, Ltd., concentrate on the more industrial of their products, and show gas overhead radiant and luminous panel space heaters for industrial and public buildings, garages, etc., gas-fired (infra-red) radiant units for heat processing, and cloakroom incinerators. *Stand D.656.*

Geo. Bray & Co., Ltd., well known manufacturers of gas burners of all types, have an excellent display. Flat flame burners, for domestic and industrial appliances are exhibited, together with domestic incandescent and street lighting burners, etc. *Stand D.545 and 442.*

British Ermeto Corporation, Ltd., exhibit Ermeto pipe couplings and valves which are built to withstand the highest industrial pressures even under conditions of extreme vibration. Available in a wide range of fittings for steel, stainless steel, aluminium and brass tubes, these couplings and valves are shown to advantage. *Stand D.723.*

The British Oxygen Co., Ltd., show oxy-acetylene welding, cutting, gouging, brazing, heating and flame cleaning equipment. Also shown are oxygen profiling and plate edge preparation machines, Argonaut and Argonarc (fluxless) welding processes and welding accessories, and a selection of rods, fluxes, compressed gases, and regulators. Of these exhibits, the Argonaut welding process is shown for the first time. The Argonarc spot welding equipment is demonstrated on the stand. *Stand D.201 and 100.*

The British Thomson-Houston Co., Ltd., have an impressive stand on which the exhibits range from an 11-kV, 250-MVA switchgear unit for power station and industrial service to industrial electric heaters and fractional horsepower motors. Many of the exhibits are shown as working demonstrations, and all represent the latest developments in their respective classes. The working demonstrations include the switchgear, just mentioned, a new design of alternator with close voltage regulation, 'Stacreepe' crane control, a high-speed batch counter (electronic), and sectioned motors running under their own power. *Stand C.511 and 410.*

British Tyre & Rubber Co., Ltd., exhibit industrial hoses and tubings, transmission and 'V' belts, conveyor and elevator beltings, rubber-to-metal assemblies, rubber mouldings, linings, coverings, fire-resister coal belts, vibro-insulators, etc. *Stand D.615.*

Brockhouse Heater Co., Ltd., well known as manufacturers of hot water and steam boilers, have an interesting stand which includes several examples of their products. Solid fuel boilers are also shown. *Stand D.405 and 304.*

Cellactite & British Uralite, Ltd., exhibit Cellactite protected metal sheeting and ventilators; Urastone incorrosible flue pipes, fittings and ducting; Kimolo (Moler) insulating bricks, hollow partition blocks, etc. *Stand B.313 and 212.*

Chandos Engineering Co., Ltd., well known for their 'Gasanair' heaters for all space heating requirements, show them to advantage on their stand. Interesting examples of gas infra-red ovens are also shown, together with rotary driers and pre-heating ovens for the stoving and plastics industries. *Stand D.757.*

The Copper Development Association, by means of photographs and display examples, invites users of copper and copper alloys to make full use of all C.D.A. services, which are available free on request. The authoritative technical books published by the C.D.A. on applications of copper in many industries, and on the properties of copper and its many useful alloys, are prominently displayed. *Stand D.232.*

Robert Cort & Son, Ltd., exhibit interesting examples of reciprocating screening-conveyors and oscillating screens, as well as rotary valves, double-gate valves, throttle valves, and tar and liquor valves. *Stand D.437 and 336.*

Crane, Ltd., exhibit malleable iron pipe fittings, forged steel flanges, gunmetal, cast iron and cast steel valves for steam, water, oil and gas lines. Steam traps, boilers, radiators and accessories for heating and domestic supply, are also shown. *Stand D.314.*

Crosthwaite Furnaces & Scriven Machine Tools, Ltd., exhibit an interesting gravity feed stoker and standard mechanical stoker and fixed grate. Other exhibits include a portable elevator and a fixed plate and Fanair to vertical boiler. *Stand D.612.*

Dunlop Rubber Co., Ltd., have three stands featuring respectively the Aviation Division, the Engineering Components Division, and the General Rubber Goods Division. The last-named shows such exhibits as anti-corrosive and abrasion resisting linings, ebonites, fittings, pipes, microporous separators, transmission, vee, conveyor including new flame-proof belting, hose, rollers, mouldings, extrusions, gaskets, and mechanical rubbers, etc. *Stand D.623 and 522.*

Easiclene Porcelain Enamel (1938), Ltd., in addition to kitchen and sanitary fittings, exhibit the well-known 4½ cu. ft. capacity refrigerator in its 'new look' casing. *Stand B.522.*

The Electric Construction Co., Ltd., feature an interesting historical exhibit entitled 'Industrial Electrical Equipment in Six Reigns,' which ranges from a D.C. motor and switch panel built in the 1880's to a diesel driven 'No-Break' continuity alternator set for telecommunications and other essential services. *Stand C.708.*

The English Electric Co., Ltd., exhibit a wide range of equipment, including fuseboards, industrial distribution boards, combination fuse switchboards, fuses, switchgear, transformers, industrial motors, F.H.P. motors, meters, instruments, rectifier equipment and mining control equipment. *Stand C.613 and 512.*

Ether, Ltd., have an impressive display of instruments of various kinds. Included are electronic potentiometer recorders and controllers, Ether-Wheelco electronic temperature controllers and combustion safeguards, 'Indicorder' temperature recorders indicating pyrometers, molten metal and surface contact pyrometers, solenoid and motor valves, pressure switches. *Stand C.700.*

Evered & Co., Ltd., show some interesting gas fittings of different types, as well as non-ferrous metal tubes, strip sections, metal hardware plastics cabinet tics builders hardware, plastics cabinet hardware, trade moulding, plumbers' brassfoundry, laboratory fittings, compression joints, etc. *Stand B.327.*

Ewart Chainbelt Co., Ltd., who are associated with Leys Malleable Castings Co., Ltd., exhibit working models of mechanical handling plant for bulk materials and packages, chains in malleable iron and steel for conveying, elevating and transmission purposes. Also shown are sprocket wheels, elevator buckets, etc. *Stand D.513 and 410.*

J. Glover & Sons, Ltd., exhibit Stormor space saving mobile storage equipment and Stormor fixed shelving. Other exhibits include the Snowhite drying cabinet and Fevolite partitioning. *Stand B.714.*

The Goodyear Tyre & Rubber Co. (G.B.), Ltd., are manufacturers of many types of rubber products for industry. Included on this excellent stand are such examples of these products as a rubber impregnated conveyor, elevator and transmission belting, vee belts, endless cord belts, industrial hose, oil and petrol hose and a display publishing the Conveyor Belt Splicing Service. *Stand D.212.*

Graphite Products, Ltd., makers, as their name implies, of various materials with a graphite base, exhibit paints, graphite greases, jointing and sealing compounds for water, gas, and steam applications. *Stand D.305 and 204.*

Harris Engineering Co., Ltd., exhibit their interesting gas unit heaters for industrial and commercial use, automatically controlled; also gas plenum heaters and steam unit heaters. Also of great interest are this firm's unit dust collectors which are designed to collect and store dust in self-contained units; these units are available in six sizes as well as special duty units. Also represented on the stand are cyclones, fans, ducting, etc. *Stand D.444.*

G. A. Harvey & Co. (London) Ltd., specialists in perforated metals, and woven wire cloth, exhibit their products to advantage. Other items on show include sheet metal and steel platework, steel equipment, and gilled tubes. *Stand B.329.*

Hills (West Bromwich), Ltd., exhibit Presweld school construction—*i.e.*, steel frame, windows, concrete roof, floor and wall cladding, roof ventilating shutters; lead and aluminium patent glazing; lantern lights, copper and leaded lights; window blinds; wall ventilators. *Stand B.615 and 512.*

James Howden & Co., Ltd., show examples of a wide range of products which includes forced and induced draught fans, secondary air fans, exhauster fans, single and multi-stage blowers, ventilating fans, sintering fans, Howden Ljungstrom air preheaters, Howden I.C.I. gas washers, Vortex dust collectors, Multivortex, Cyclone and Centivell dust collectors, Howden-Lysholm compressors, and steam turbines for auxiliary purposes. *Stand D.605.*

Imperial Chemical Industries, Ltd. (Metals Division) display copper, brass, cupro-nickel, phosphor-bronze and other non-ferrous alloys in plates, sheets, strip, tubes, wire, rods and extrusions. Domestic water, gas and sanitation services are represented by light gauge copper tubes to B.S. 569 and a range of compression and capillary fittings made by Fyffe & Co., Ltd., Dundee, a subsidiary company of I.C.I. Underground water and gas services also are represented in the display of 'Kuterlon' long length copper tube to B.S. 1386/1947, also eminently suitable for radiant panel heating. *Stand D.409 and 308.*

International Combustion, Ltd., have as their central exhibit the massive Lopulco mill which, it is claimed, produces more material than any other roll mill yet designed. A working model demonstrates the effect of pulverised fuel corner burners in a water-tube boiler setting. Other exhibits include the 'Usco' plate type air heater, a type 'L' louvre travelling grate stoker, and a Vacseal pump which uses no sealing water and is incorporated in a working display to demonstrate one of its applications and to show that gland leakage troubles are eliminated and a working model of a gravity bucket conveyor system, one of the many types of plant available. *Stand D.617 and 516.*

Jenson & Nicholson, Ltd., exhibit such examples of J. and N. industrial finishes as stoving enamels, wood finishes, insulating varnishes, marine finishes, transport finishes, peelable protective coatings, anti-corrosives, etc. Also shown are Robbialac enamel, paints, and varnishes for decorative purposes. *Stand B.515 and 414.*

Keith Blackman, Ltd., exhibits include a range of controls, such as governors, automatic shut-off valves (both high and low pressure), back pressure valves. Additional exhibits include burners, injectors, and nozzles, compressors, soldering irons, laundry irons, a gas-fired unit heater and a gas-fired combustion chamber. There is a 'live' demonstration covering burners on both low and high pressure gas and a mixture controller with air operated gas shut-off. The air and high pressure gas are supplied by a Keith Blackman 'Tornado' three-stage blower and a 1A compressor. A recent development is the mixture controller and the high duty strip burner, the latter being designed for flame retention and is suitable for high-mixture pressures. The prototype of the mixture controller is in operation but supplies will not be available until later in the year. *Stand D.755 and 654.*

The Kleen-e-ze Brush Co., Ltd., exhibit condenser cleaning guns and bullets, Turbulators Brush-Welt, Keza tube cleaners, Kez-Strip brushware, Florigene dust-allayer, industrial and mechanical brushware, floor polish, Pithead Baths' Brushware, etc. *Stand D.143.*

Lamont & Co., Ltd., exhibit the Securex joint which, it is claimed, has superseded the old and laborious method, at the same time providing a joint of greater strength and durability. Securex joints give precision work, can be relied on for water, gas, etc., and will withstand any side strain or variation in temperature. A Securex joint is done with an expanding tool and a spanner. *Stand B.630.*

The Morgan Crucible Co., Ltd., have an excellent display of 'Morganite' carbon products which range from crane current collectors and seals to gland rings for turbines and compressors. Also shown are 'Foliac' graphites, jointing compounds, greases and paints. *Stand D.305 and 204.*

Jack Olding & Co., Ltd., exhibits include a wide range of Onions equipment, the Galion motor grader, Hendrix dragline buckets, Elstree heat planer and Barber-Green Olding standard finisher, Junior finisher and 44C vertical boom ditcher. The last-named is notable as being the only machine of its type which can dig straight down, and is used extensively for digging trenches 18 in., 21 in. and 24 in. wide to a maximum depth of 8 ft. 3 in. The unique vertical boom with its milling action cutters leaves no ramp to be excavated by hand, and will cut through very hard ground. An automatic overload release protects the machine from damage in the event of an obstruction being encountered. *Outdoor Stand 1347 and 1246.*

Parkinson & Cowan (Gas Meters), Ltd., specialists in product finishing, stoving and heating plants, have an excellent stand which features their gas-fired radiant heat tunnel and panel units and conveyors. Also shown are pressure gauges, laboratory gas test meters and rotary check meters. *Stand D.440.*

Pegson, Ltd., well-known to the gas industry for their coke screens, devote the whole of their stand to their self-priming, centrifugal, plunger and diaphragm pumps for contractors, general and special engineering purposes. Both portable and fixed models are on view. Two of their most recent portable pumps are close coupled to Lister Freedom range diesel engines. These are a 6 in. pump powered by a 31 h.p. at 1,600 r.p.m. Lister F.R.4 diesel engines, with a capacity of 1,100 gal per minute, and a 4 in. pump powered by a 17 h.p. at 1,800 r.p.m. Lister F.R.2 diesel engine which handles up to 600 gal. per minute. These two pumps are extremely compact units, and when fitted on a four wheel chassis are very portable. Alternatively, they can be supplied on a two wheel high speed chassis suitable for touring. *Stand D.421.*

Plus Gas Co., Ltd., exhibit their anti-corrosion fluids for dismantling corroded and rust-bound machinery of all kinds and for protection of new and re-assembled plant. *Stand D.129.*

Purimachos, Ltd., display their refractory cements for all purposes, plastic fire cement in different grades, Alukos aluminious fire cement in powder form, Drykos high temperature cement in powder form. Also shown is Fixatile plastic tile cement. *Stand D.251.*

RTSC Home Sales, Ltd., home sales organisation for mild steel flat rolled products of Richard Thomas & Baldwins, Ltd., and the Steel Company of Wales, Ltd., exhibit steel sheets, tinplate, plates, hot-rolled/cold reduced coils, blackplate, etc. *Stand D.407 and 306.*

Radiation Group Sales, Ltd., are represented by their Solid Fuel Division on an excellent stand which includes most types of solid fuel grates and appliances. *Stand B.501 and 400.*

The Rawlplug Co., Ltd., exhibit Rawlplugs, Rawlbolts, Screwanchors, Boltanchors, Whitebronze plugs, Rawlanchors, Toggles, hand, mechanical, electrical and pneumatic boring tools, alloy chisels, Durium drills, Girderclips, soldering irons, insulated staples, Durolastic sealing compound, Durofix, Duroglue and Plasticwood. *Stand C.707.*

R. Russell & Sons, Ltd., display to advantage their well-known Dainty Minor gas cooker which, well constructed of cast iron and vitreous enamelled, is specially designed for small kitchens and flats; it is fitted with two boiling burners and a griller. *Stand A.327 and 226.*

Saunders Valve Co., Ltd., exhibit their well-known diaphragm valves for fluid control, with various linings and the mechanism isolated from fluid. The pumps are operated by handwheel, lever or power. Safran centrifugal pumps, single, multi-stage and vertical trunk, and electric, petrol, and belt driven, are also on show. The range of pumps, in eight sizes, is now extended by many adaptations for special purposes and by the introduction of a series of multi-stage and vertical trunk pump models. The multi-stage pump is represented by a 1½ in.-2 in. model of three-stage arrangement, fitted with a 12 h.p. motor. The impellers are of contra-flow type, whereby the thrust load of two stages is hydraulically balanced. *Stand D.125.*

Senior Economisers, Ltd., exhibit a full size Senior 'H' tube economiser for industrial plants and sections of the welded and Twintube economisers as used in central power stations, etc. Scale models of all types are shown. *Stand D.239.*

The Sigma Instrument Co., Ltd., exhibit multi-dimension inspection machines, including automatic types with magazine feed and conveyor belt sorting for checking mass produced components. Mechanical single-spindle and turret types, and pneumatic comparators and bench micrometers are also shown. *Stand D.310.*

Sperryn & Co., Ltd., display their well-known 'Spersom' gas thermostats for both industrial and domestic use. Relay valves and flame failure devices, spring-loaded, self-lubricated main cocks and small fittings, are also shown. *Stand D.543.*

The Stanton Ironworks Co., Ltd., famous for their centrifugally-made (spun) concrete pipes and lighting columns, etc., demonstrate them effectively on *Outdoor Stand 1322.*

John G. Stein & Co., Ltd., exhibit refractories for all purposes, firebricks, silica bricks, magnesite, chrome-magnesite, and chrome bricks, sillimanite, mullite, and high, alumina refractories refractory cements and patches. *Stand D.313.*

Stelcon (Industrial Floors), Ltd., have, as in previous years, the floor of their stand formed with 'Stelcon' anchor steel plates which have been widely used both at home and abroad in many types of factories because of their dustless, hygienic, and wear resistant qualities. The structure of the stand incorporates 'Stelcon' storage wall units, and there is also a full sized unit displayed on a rotating platform. 'Stelcon' storage walls provide a quick solution to the problem of storing loose bulk materials such as coal, coke, gravel, scrap, etc., and have a wide range of applications in many industries. Made of reinforced concrete, they are self-supporting and can retain loads against either or both sides simultaneously or separately. Rearrangement or re-siting, if necessary, can be carried out with the minimum of delay. *Stand D.423.*

Richard Thomas & Baldwins, Ltd., exhibit flat rolled products in stainless electrical steels and light alloys, and fabrications in steel and light alloy. Merchant mill products are represented. *Stand D.407 and 306.*

Tubela Engineering Co., Ltd., show tube bending machines, hand and hydraulic, for all classes of tubing. Pipe vices and portable stands are also displayed, together with slate cutters, flat and corrugated asbestos cutters, slate and asbestos punches. *Stand D.338.*

Thos. W. Ward, Ltd., exhibit Crawler tractors and contractors' plant, photographs and displays showing T.W.W. group's activities, including iron and steel engineering and sheet metalworking machinery, are a feature of the stand. *Outdoor Stand 1334.*

F. E. Weatherill, Ltd., exhibit their hydraulic loading shovel in ¾, 1 and 1¼ cu. yd. sizes. These have a controlled scoop, low headroom, and are suitable for handling coal, coke, etc., in bulk. *Outdoor Stand 1109 and 1008.*

Wellington Tube Works, Ltd., show steel tubes and fittings, fabricated pipework, unit air heaters (gas, steam and hot water). Process, plenum, and convector heaters are also shown, and heat exchangers, fabricated tubular steelwork, and drop forgings. *Stand C.300.*

Winn & Coales, Ltd., show several new anti-corrosion protective tapes and compounds. Densyl 160 tape conforms in composition to standard Denso tape and incorporates a thermal extender, providing protection between 0°F. and 160°F. Densopol tape consists of glass tissue felt fully coated on both sides with standard Denso tape compound and backed with a polythene film. The feature of this tape is its inorganic carrier and dry external surface. Denglas tape comprises a continuous filament woven glass fabric which is coated, one side having a heavy coating compound for application to the metal surface, the other side having only a film coating. Densochrome tape is a significant development possessing a metallic chromate inhibitor and may be specifically used for the protection of bi-metallic junctions in which aluminium is one of the metals. The compounds are Densoset, a product of soft paste consistency used for bedding thermal insulation sections to refrigeration plant and components, and Densofil, which is similar, and incorporates granulated cork. It is of particular use for filling cavities and cracks in cork sections, for refrigeration plant and components, to maintain thermal efficiency. Denso anti-corrosion, waterproofing and sealing products are also featured. *Stand D.150.*

The Yorkshire Copper Works, Ltd., exhibit solid drawn tubes, copper, brass, cupro-nickel and other non-ferrous alloys, tubes for general engineering and domestic water services, etc. 'Yorcalbro,' 'Yorcorom,' condenser, heat exchanger tubes are also shown, together with 'Yorkshire' patent capillary fittings for light gauge tubes for hot and cold water, gas heating, etc. *Stand B.723 and 634.*

I.G.U. Dictionary Panel

A PANEL meeting of experts chosen by the associations interested in the elaboration of a multilingual dictionary of the gas industry was held in Essen on March 9 and 10, at the invitation of the Arbeitsgemeinschaft des deutschen Gasfachs. This dictionary will replace the former trilingual 'Vocabulary of the Gas Industry,' published by the International Gas Union in 1937 and now entirely out of print.

The meeting was attended by the following representatives of member associations:—

Arbeitsgemeinschaft des deutschen Gasfachs: Dr. Kammüller and Dr. Wolf.

Association Royale des Gaziers belges: M. Touwaide and Miss De Wolf.

Association Technique de l'Industrie du Gas en France: Messrs. A. Lihrmann and A. Lamboi.

Associazione Nazionale Industriali Gas: Dott. A. Böhm.

Institution of Gas Engineers: Dr. W. T. K. Braunholtz.

Vereniging van Gasfabrikanten in Nederland: Mr. de Voogd and Miss Rappard.

The delegates of Spain and the United States of America were unable to attend the meeting.

The sessions were held in the Council Room of the Ruhrgas A.G., placed at the disposal of the panel by Mr. H. Schelberger, Director, who had made excellent arrangements which greatly facilitated the business.

As General Secretary of the International Gas Union, Mr. R. H. Touwaide addressed the meeting and outlined its purpose. He then conveyed the wishes for a successful outcome, expressed by Mr. R. W. Hendee, President of the Union.

The members unanimously agreed to invite Mr. A. Lihrmann to take the chair. Mr. Lihrmann had agreed to undertake the preliminary work and to get in touch with UNESCO.

The animated and sometimes difficult discussions led to precise conclusions and will enable the compilation to be started immediately.

After the sessions, the Ruhrgas arranged a dinner to which members of its staff and the members of the panel were invited.

The delegates had the opportunity to visit the Gaswärme Institut at Langenberg, where they were the guests of Professor Dr. Ing. Fritz Schuster, who showed them round the laboratories of which he is in charge.

A Comparator for mild steel and metal-arc electrodes has been published by the British Welding Research Association. The comparator was originally produced for members of the B.W.R.A. and was generally acclaimed for the ready-to-hand method by which it enabled welders, designers, and others to obtain the basic characteristics of the electrodes, as specified by the makers, in accordance with the British Standard 1719. On the front of the rule appears the essential information on the coating, position, current, and voltage for given electrode groups together with the nearest American equivalent, and on the reverse side are shown the particular electrodes and manufacturers' names. The Association points out that the information on the comparator is correct as published, but alterations in certain electrodes may be made from time to time and more detailed information on any of the electrodes represented can be obtained from the electrode manufacturers' leaflets.

A FASCINATING EXHIBITION

SHOWING Thorncliffe to Thorncliffe people—that, in a nutshell, is the purpose and design behind the new exhibition of the organisation, craftsmanship, products, and history of Newton Chambers & Co., Ltd.

Mr. R. F. A. Sampson (Chemicals Branch Sales Manager) has been concerned with the planning of the exhibition which has been designed by Mr. Victor Rotter. The exhibition will be permanent, but changing in presentation as required. It is designed to enable all who earn their livelihood at Thorncliffe to see what their colleagues are doing, how the firm began, its objects, and its spirit as evidenced by its craftsmanship and its recreational facilities. Incidentally, the exhibition will enable a visitor to gain quickly a comprehensive picture of Thorncliffe which would take at least a day to obtain by touring the works. It will mean, too, that the visitor with but a short time available will be able to choose those places to see which interest him most.

The foyer at the entrance to the exhibition is tastefully decorated in a grey and terra cotta, to which a gay splash of colour is added by flowers supplied and tended by the garden staff. A tablet informs the visitor that 'The story of Thorncliffe is the story of a community built around a group of industries—of past and present-day builders and craftsmen who found their life's work in this valley.'

A striking engraved Perspex mural, designed by John Farleigh, offers symbolic representation of the products of Thorncliffe and the craftsmanship that lies behind their making. On the opposite wall is a Mercator projection of the world, made of brass and walnut veneer, on which the locations of the Company's overseas agents are picked out in coloured symbols.

Spirit of Co-operation

The visitor is reminded here that at Thorncliffe thousands of people are giving of their brains, energy, and goodwill, more than they are obliged to give, and in this way are creating a fine spirit of co-operation.

A notable feature of the historical section is two original paintings by Terence Cuneo. The first depicts William Murdoch demonstrating his invention of gas lighting to George Newton and Thomas Chambers, an incident which was to lead to the eminence held by Thorncliffe to this day in the field of fabrication of gasworks plant. The second picture captures an amusing and familiar scene at Thorncliffe at the close of the last century when it was the custom of Mr. T. C. Newton, at that time Managing Director, to use one of the works locomotives as a 'taxi' to the main line station.

From the historical section the visitor passes to a series of bays, each of which is devoted to one of the main departments of the company.

First, is the heavy construction Division, where constructional engineering achievements are illustrated mainly by fascinating scale models. A $\frac{1}{16}$ in. to the foot model of tower gas purifiers includes a model of the travelling Goliath crane with which the oxide trays are handled. The bay includes a model of a tar distillation plant. The importance of the mobile engineering department is emphasised by a notice that 'Three-quarters of the company's excavator production is exported. The excavator is an important dollar-earner.'

An eyecatching feature of the Light Castings Department bay, which comes next, is a built-up section showing the installation of a 'Redfyre' and 'Bac-boiler' as incorporated in thousands of homes. The display includes a single-compartment gas-heated steaming oven as supplied to the Ministry of Education for the school meals service. The 'Lith-cote' finish of the interior is an example of inter-departmental co-operation.

The wide range of domestic and industrial products associated with the parent 'Izal Germicide,' introduced in 1890, is shown in the chemicals section.

The production departments are followed by sections illustrating services to production. Under the title 'Craftsmen in the Making' the apprentice training scheme is fully covered, from examples of the initial aptitude tests taken by boys joining the company, the pre-entry course syllabus, through examples of foundry and engineering training, to the pre-National Service course and the care taken to keep in touch with the lads during their period in the Forces. Careers for girls are also illustrated.

The exhibition is not primarily an effort to show the products of the company. Its purpose is to illustrate the conditions and circumstances that yield these products—the good relations between workers and management, the *esprit de corps*, and the feeling that each man is not only a skilled craftsman but an essential part of the firm. The emphasis is upon the people who do the job, and how they are recognised and encouraged as craftsmen in partnership with each other and with their work.

The London Fog Disaster

THE Spring issue of *Smokeless Air*, the journal of the National Smoke Abatement Society, contains a survey of the London smoke-fog of December last, which is described as—by the criterion of human life—the greatest disaster experienced in this country during the time of peace for many years, and as 'likely to prove to be the gravest event in the history of air pollution.' Although it is considered that the disaster has not been followed by the public concern that would have been evident in any other catastrophe of similar magnitude, the journal suggests that 'behind it all, and perhaps especially in medical circles, there are signs of a shock that may have far-reaching consequences,' and that in the future it may be seen that the fog was 'a climacteric in the long struggle for a cleaner atmosphere.'

Mortality, illness, animal health, the effects on plant life, and some of the economic consequences are dealt with in the article. The figure that should be taken as 'official' for the number of deaths in Greater London caused by the fog is 4,000.

The filters in the air conditioning plant at the National Gallery clogged at a rate of 26 times the normal over one 24-hour period during the fog, and in one period of four hours the rate was 54 times the normal. Although the cattle at the Smithfield Show suffered severely—14 died or had to be destroyed—sheep and pig exhibits escaped, and there were no noticeable effects on animals at the Zoo.

Many displays of winter-flowering plants at the Royal Botanic Gardens, Kew, were completely spoiled, and orchids, fuchsias and begonias were affected. The Kew stocks of varieties of coleus were largely destroyed. Growers suffered much from damage to chrysanthemums and winter cherry ready for the Christmas trade. Large London shops and stores estimate that their turnover was seriously reduced, £11,000 being the figure given in one case. On the basis of their own losses one store estimated that the cost of such a fog to a retail firm would be about 5s. in each £100 of annual gross profit.

CHARING CROSS EXHIBITION

MR. L. W. JOYNSON-HICKS, Parliamentary Secretary of the Ministry of Fuel and Power, on April 15 visited the Fuel Efficiency and Smoke Abatement Exhibition organised by the Solid Smokeless Fuels Federation at Charing Cross Underground Station. The exhibition set out to demonstrate that the use of solid smokeless fuels will help to abolish smoke pollution caused largely by domestic chimneys in London, and that better standards of heating and comfort in the home are made possible by the use of these fuels in modern efficient appliances. The exhibition closed on April 25.

Exhibits included a range of modern domestic appliances for heating, cooking and hot water supply, alight, burning solid smokeless fuels. There was a display showing the advantages of structural insulation which the Federation regards as being of the utmost importance in conserving coal. The need for good fuel storage was also demonstrated, and there was a display of solid smokeless fuels with a comparison of their heating efficiency with that of ordinary coal on various appliances. The research work and testing of fuels and appliances in the laboratories maintained by the members of the Federation were also illustrated.

Mr. Joynson-Hicks, in a short speech, said the Government was setting up a special committee to enquire into the more technical aspects of smoke abatement, but each one could help in the matter by preventing fires from smoking. Nearly 3,000 people a day had been round the exhibition, and many enquiries had been received. If people would burn more coke in their domestic fires they would help to achieve the dual object of reducing the smoke which went up the chimney and using fuel more efficiently.

Mr. Henry F. H. Jones, Deputy Chairman of the Gas Council, said one of the criticisms of British industry sometimes made was that new discoveries in the laboratory were not applied in the factory until after a rather long period. They were trying to shorten the time required to bring public opinion regarding the use of smokeless fuel up to date with technical knowledge which had been obtained during recent years.

COMPANY NEWS

GLOVER AND MAIN

Group trading profits, 1952, £438,845 (£626,536) and investment income £36,118 (£25,957). Net profit £151,845 (£236,300) after tax £219,917 (£333,486), depreciation £73,739 (£63,773), etc. Net profit of parent £71,503 (£64,125). Dividends, including 15% and bonus 7½% (same) on ordinary, £66,025 (same), forward £128,453 (£122,975). Current assets £3,050,672 (£3,249,981). Current liabilities and provisions £745,424 (£988,905). Capital commitments £90,000.

MARYBOROUGH (QUEENSLAND)

The Directors of the Maryborough Gas and Coke Co., Ltd., in their report for the year ended December 31, 1952, state that the demand for gas is still very great and a large number of residences had gas installed during the year. Gas sales showed a substantial increase as compared with 1951. Expenditure, however, also increased very considerably, due principally to four increases in the basic wage, totalling 31s. per week, and five increases in the price of coal totalling 5s. 2d. per ton. Recent events, however, point to the fact that the inflationary spiral during the previous two years may now be stemmed and companies are hopeful that they may be able to budget for expenditure 12 months ahead. There has been a good demand for residual products during the year. Crushed coke is proving a boon to people in country districts where there is no gas available. The profits, after writing off £1,100 for depreciation and transferring £700 to reserve fund, amount to £6,470, making, with the amount brought forward from last year, £7,143. After provision for taxation, (£2,000), and for employees' retiring allowance and long service leave (£500), there is a balance at credit of profit and loss appropriation account of £4,643. The directors recommend payment of a dividend of 5%, leaving a balance to be carried forward of £930.

C. & W. WALKER

Dividend 10% and bonus 5% year to January 31, 1953 (both same). Group profit £27,835 (£27,474), after tax of £34,996 (£45,005). To reserves £11,300 (£10,000). Forward £46,388 (£41,704).

ALEXANDER DUCKHAM

Final dividend 17½% (same), making 25% for 1952 (same). Net profit £35,531 (£47,148) before tax of £25,124 (£31,459). Add surplus on sale of assets £13,313 (£1,470) and royalties accrued in respect of earlier years nil (£3,833). Forward £32,730.

Impending Case Against B.E.A.

IN a Question to the Attorney-General on April 23 Mr. GERALD NABARRO (Kidderminster) asked whether he had yet completed his enquiries concerning an illustrated publication entitled 'The Place of Electricity in the Nation's Fuel and Power Policy,' a copy of which had been sent to him, which purported to represent the views of the British Electricity Authority, but carried no imprint of the body or persons issuing the document, and no imprint of the publishers or printers and thus constituted an offence; what steps had now been taken to establish whether this document was published with or without the authority of the B.E.A., or by it; and, in view of the requirements of the statutes bearing on this matter, what steps he was taking to establish the identity of the issuers, printers, and publishers of the document to secure compliance with the law.

The Attorney-General, in a written reply, said he had now completed his enquiries and had given instructions for proceedings to be instituted against the B.E.A. for an infringement of the Newspapers, Printers and Reading Rooms (Repeal) Act, 1869.

Gas-Electricity Showrooms

THE POSSIBILITY that electricity and gas undertakings might share the same offices and showrooms in the not-too-distant future was envisaged by Mr. R. Turner, Chairman of the Eastern Gas Consultative Council, when he addressed his opposite numbers in the electricity industry. Mr. Turner accepted an invitation to review the working of his own Council, extended by Mr. W. J. Bennett, Chairman of the Electricity Council, who said it was all to the good to know each other's problems. Competition was good, said Mr. Bennett, but should not be bitter. Mr. Turner suggested that the conducting of commercial operations under one roof might be a good thing —especially from the consumer's point of view. The joint organisation would cover gas, electricity and solid fuel.

At the same time, Mr. Turner doubted the practicability of the joint meter-reading scheme. He also discarded the idea that the two consultative councils could work as one body successfully.

The Morgan Crucible Co., Ltd., announce that the sales and technical departments of its refractories group are now operated from the works at Neston, Wirral, Cheshire (Telephone: Neston 1406; telegrams, Hightem, Neston).

MIDLAND SECTION I.G.E.—

Continued from p.262

never came back, but more particularly they were pleased to welcome him as President of the Institution. In thanking Mr. Currier he would also express the thanks of the Midland Section for the co-operation which had at all times been given by the gas boards to the work and life of the Institution. The Institution was in turn playing a tremendous part, directly and directly, for the well being of the gas industry, and had made no small contribution to whatever progress had been made since nationalisation.

While from every angle harmony and helpfulness existed between the Institution and the Gas Council, one with the other, it would be a sad day for the industry if the inherent independence of that professional body were ever in any way impaired. It was just four years ago, immediately following nationalisation, that the then chairman of the Gas Council, Sir Edgar Sylvester, reminded them that the gas industry had a great reputation for team work, and that the exercise of individual and local pride in the efficiency of each unit had worked toward the general good of the industry. He went on further to remind them that a healthy and progressive organisation must have individual and local initiative in addition to a measure of central control. That some control was necessary was obvious, for without it there would be confusion and irresponsibility. Initiative was equally essential for without it there would be stagnation.

There was without a doubt a mine of truth in those observations, and perhaps one of the most important tasks today was to ensure a right balance as between guiding principles emanating from the boards and local initiative and responsibility at unit level. The Midland Section had always been a happy family of gas engineers, eager to accept responsibility and ever ready to assist each other.

The 'Manchester' Process of Liquid Purification

On April 18 the Manchester District Junior Association of Gas Engineers had the opportunity of seeing the 'Manchester' liquid purification plant installed at the works of the Birchenwood Coal and Coke Co., Ltd., by R. & J. Dempster, Ltd., of Manchester.

In this plant the important chemical reactions are:—

Purifier

(1) $2NH_3 + H_2O + CO_2 + H_2S = NH_4HS + NH_4HCO_3$
(2) $NH_4HCO_3 + H_2S = NH_4HS + H_2O + CO_2$

Reaction Tank

(3) $3NH_4HS + Fe_2O_3 + 3NH_4HCO_3 = Fe_2S_3 + 3(NH_4)_2CO_3 + 3H_2O$
(4) $2Fe_2S_3 + 3O_2 = 2Fe_2O_3 + 6S$

The plant was designed to remove the hydrogen sulphide in a stream of 3 mill. cu.ft. of gas per day from 600 grains per 100 cu.ft. down to Referees Standard or 1.5 p.p.m. (about 0.1 grain per 100 cu.ft.), which represents 99.857% removal.

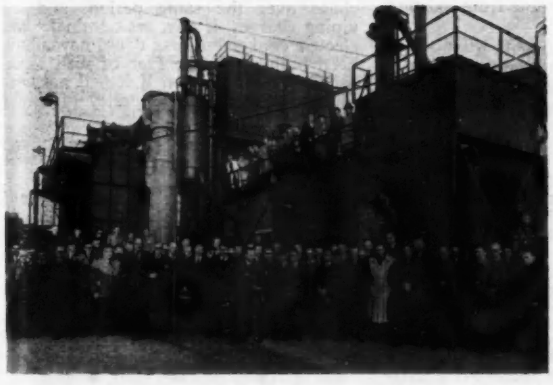
The main items of plant are:—

Purifier

The purifier is made in two units, each of three bays of welded steel construction. The two units are worked in series but either may be bypassed. Two bays at the foul gas end are fitted with open cascade filling and the subsequent four bays with ordinary wood grids. The washing medium is fed to the six bays in parallel through spray units specially designed to prevent blockage, passing downwards, countercurrent to the gas, and out of each bay through sloping channels (to prevent frothing) to the collecting trough before the reaction tank. The sloping channels form part of a seal at the collecting trough, thereby ensuring that no gas can pass forward from the purifier.

Reaction Tank

The partially fouled liquor flows by gravity into the reaction tank (this part of the plant is duplicated) where the space velocity is such that reaction 3 above is allowed to go to completion.



Members of the Manchester District Junior Association of Gas Engineers at the works of the Birchenwood Coal and Coke Co., Ltd.

Oxidiser

The liquor, which now contains an appreciable quantity of insoluble sulphide (Fe_2S_3) is pumped from the reaction tank to the oxidiser where the oxidation of the ferric sulphide is effected by the injection of very fine air bubles into the fouled liquor. The liquor is regenerated and elemental sulphur is produced. The oxidiser is made in one unit of welded steel construction but divided into four sections, any of which may be isolated and drained while working on the remainder.

The liquor is fed to each compartment in parallel through a common seal leg incorporated to prevent flooding back should the main circulation cease through any cause. Air for oxidation is admitted through eight diffusers in each compartment from a compressor situated in the pump house. The cycle is completed with the return of the revivified liquid to the purifiers and is effected by gravity at a constant head from the overflow in each compartment. The feed to the filter press may be taken from a point between these overflows and the purifier sprays or alternatively from the base of the defrother. Froth formed in the oxidiser is taken away above the liquor overflow and passes into the defrother for settling.

Defrother

This vessel, of welded steel construction and of circular section, is situated adjacent to the oxidiser and receives the froth formed in that vessel.

Pump House

The house contains:—Two main circulating pumps (one standby) each of 80,000 gal. per hour capacity. Both are centrifugal type MoPumps, one driven by steam turbine and the other by electric motor. There are two air compressors (one standby) of Alley and Maclellan manufacture, capable of delivering 300 cu.ft. of free air per min. up to 30 lb. per sq. in. One unit is steam driven and the other electric driven. There are three reciprocating type pumps (one common standby) for transfer of fresh liquor and feed to filter press.

In addition to the foregoing, there is a mixing tank for preparation of make-up liquor and a storage tank for holding a stock of fresh liquor for use as required.

Filter Press.

Regular bleed of liquor and/or froth bearing elemental sulphur is fed to an 80-chamber filter press, each chamber dropping a pressed cake 36 in. square x 1¼ in. thick. The filtrate is returned to the plant circulation or partially withdrawn (in order to keep down the proportion of fixed salt) as desired.

Feed to Drier

Periodically the press is 'dropped' and the sulphur cake removed through scraper conveyor and screw conveyor to the rotary drier. The drier consists of a casing containing a nest of steam-heated tubes. The nest slowly revolves, the cake passing through the drier over the outsides of the tubes, the saturated air being extracted by means of a fan. The dried product is then transferred from the drier outlet to a storage hopper for easy loading to road vehicles.

The arrangement and design of the plant from the filter press up to and including the storage hopper was undertaken by the Birchenwood Coal and Coke Co., Ltd.

BRITISH STANDARD GLOSSARY

THE GLOSSARY OF TERMS used in Illumination and Photometry, which has recently been published by the British Standards Institution as B.S. 233:1953, is a revision and extension of sub-section 81 of the Glossary of Terms used in Electrical Engineering (B.S. 205).

Many of the definitions and terms included are in agreement with those adopted by the International Commission on Illumination and some of the quantities defined are based on the properties of the 'Standard Observer' agreed by the Commission. The foreword to the glossary points out that while purporting to give the generally accepted meaning of a term, the definition thereof must not be regarded as in any way taking the place of the specification.

The glossary is divided into sections dealing with quantities and units of light, sources of light, photometer, photometric properties of materials, photometry of fittings and installations, types of lighting, and natural lighting. An alphabetical index is included.

Copies of this glossary are obtainable from the British Standards Institution, Sales Branch, 24, Victoria Street, London, S.W.1. Price 3s. 6d.

MR. D. SANDYS, Minister of Supply, stated in a parliamentary written reply on April 27 yesterday that he was asking steel-plate makers to allot a somewhat larger proportion of available supplies to shipbuilders and certain important sections of the engineering industries. He added that this would be facilitated by the increased supplies of steel plate which are now coming forward. In addition, he had asked the newly appointed inter-departmental committee to arrange with the producers for adjustments in deliveries to individual consumers.

Electrical Flashes

. . . . *News and Views of Current Events in the Electricity Supply Industry*

Promotional Advertising

SPEAKING AT THE opening of the annual conference of Electrical Housecraft Advisers and Senior Demonstrators, organised jointly by the Electrical Association for Women and the Electrical Development Association, Lord Citrine forecast that the electricity boards would soon be permitted to engage in a 'reasonable measure of promotional advertising.'

Stressing the need to put over the message that electricity boards were now able to sell as much power as required, with perhaps the exceptions of periods of extremely cold weather, he said that by that he did not mean the incidence of bitter competition with the other industries.

When they worked together in the service of the community industries observed a certain code of conduct. He emphasised that the gas industry had been very 'ingenious' in its promotional activities and had evoked some criticism from the electricity supply industry. But the industry should not decry its competitors. Good salesmanship, he said, consists in pointing out the advantages of one's own products and services to consumers.

* * *

Electricity from Turf

FOUR small electricity generating stations to be fired with turf are to be erected in Eire. The stations which, it is hoped, will be in operation in about three years' time will be located near Kells, south-west Kerry; near Miltown Malbay, west Clare, at Screeb, near Maam Cross, Connemara; and near Dungloe, on the west coast of Donegal.

There has for long been a considerable industry in these areas for the turf which has been dug out by the local population, and these new stations will now provide an assured market for the surplus. In addition these new stations will facilitate rural electrification in areas which, owing to their distance from the existing transmission system, might otherwise be considerably delayed.

The capacity of these stations has not been divulged, but an indication can be gained from the fact that each will require a minimum of 30,000 tons of turf annually. The Electricity Supply Board's Allenwood power station, which has two 20,000 kW generating sets, needs about 180,000 tons of turf per annum.

* * *

Blanket Danger

THE electric blanket is a device which must be treated with great respect or it may become an expensive and dangerous source of warmth. The story of the husband who, stretching out an affectionate hand to embrace his wife in bed beneath such a blanket and found her 'live' is one of which the outcome was no worse than a 'shock'; but in many other instances the result of blanket faults has been serious.

The Burton Accident Prevention Council recently discussed the matter following a local fatality in a fire caused by an electric blanket. They received a report from the town's Chief Fire Officer, who said there were 643 fires in electric blankets throughout the country during 1950. Of that total 216 blankets caught fire due to broken elements or short circuits.

Among other causes reported by fire authorities were 29 cases of failure of thermostats or safety fuses, 72 cases of overheating when no thermostat was fitted, 10 cases of faulty connections, 11 of faulty switches or plugs, and 15 of faulty cable or flex. The fire officer advised users to have the appliance overhauled periodically. He also warned against allowing children or infirm persons to use the blankets without supervision, and against leaving the current on too long even if fitted with safety devices.

* * *

Rural Development

TO MARK the connecting up of the 2,500th farm in the area of the South West Scotland Electricity Board, an electric teamaker was presented to the occupier of Ballagan Farm, near Balloch. The apparatus was a gift from the Board.

Mr. James Gogan, Chief Commercial Officer to the Board, reviewing the progress made since vesting day, pointed out that previously supplies to farms and villages had all too often been dealt with piecemeal, there being a marked tendency to neglect the small farms and hamlets which were remote from existing power lines.

The Board had reached a decision that rural electrification must be dealt with by properly planned development programmes. Accordingly, early in 1950 a development programme was adopted for each of the sub-areas and it was noteworthy that 66% of the total number of farms in the area were now connected to the Board's supply, a figure believed to be the highest attained by any board in the United Kingdom. In the Clyde sub-area, where Ballagan Farm was situated, over 80% of the farms were now connected.

* * *

Too Expensive

PROTESTS against the increased electricity tariffs which came into operation on April 1 were made by a deputation from the British Pottery Manufacturers' Federation at a meeting of the Midlands Electricity Consultative Council at Walsall (reports the *Electrical Review*).

Heading the deputation, Mr. J. F. Gimson, Managing Director of Worcester Royal Pottery, said that electricity was becoming too expensive to use industrially. The pottery industry could not put up its prices without jeopardising its export trade, which was vital to the country's economy. As an industry it was impossible to plan ahead or to put any capital into equipment when there was no stability and continual changing of tariffs, he declared. It seemed totally wrong that a vital export trade should be penalised for the sake of uniformity. The Council decided to put the deputation's case before the members of the electricity board.

Nothing New

MOST people probably have the idea that the term 'nutty slack' was a recent inspiration of some bright employee of the National Coal Board. 'Reflector,' columnist of the *Electrical Review*, says he was quite taken back when he accidentally hit upon the description in the issue of that paper for November 9, 1906. It occurred in a comparison between two dry-back marine boilers, one hand-fired with best hard steam coal and the other served by a Bennis stoker with 'nutty slack.' This, he observed, is the best way to use the stuff—not for domestic fires.

* * *

Case for Simple Hire

WRITING in the April 9 issue of the *Electrical Times*, Mr. N. F. Marsh, Chief Commercial Officer of the East Midlands Electricity Board, observed that in spite of strenuous efforts on the part of the supply industry to increase the sales of electric cookers only modest headway is being made, taking the country as a whole. He wondered why the industry has been so ready to turn its back on the time-honoured and well-tried instrument of simple hire.

The capital and wiring costs of the smallest electric cooker spread over seven years on hire-purchase amount to about 2s. 4d. per week, whereas there are a number of gas cookers which sell at 1s. 8d. per week or less on hire-purchase over the same period, and the piping charges, if any, are nominal. The electric cooker business could never have been built up in the face of well established gas competition if it had not been for the widely adopted policy of simple hire.

Many thousands of electric cookers were put out on hire between the two wars at rentals of 3d. to 5d. per week, which included all maintenance, and partly as a result of this policy the domestic load factor was improved out of all recognition. Simple hire business can be picked up successfully to-day, asserted Mr. Marsh, at rentals of around 1s. to 1s. 2d. per week and will satisfy many consumers who cannot afford 2s. 4d. per week for hire-purchase.

* * *

Fish Control

METHODS have been devised of controlling the movements of salmon and trout in Highland rivers where hydro-electric schemes are in operation. An electrified screen has been produced to prevent these fish from swimming into the tail race of a power station when going upstream. Another screen shows promise of being able to divert smolts away from an aqueduct leading to the turbines. A device has also been developed which counts fish on their way up and down fish passes without recording the passage of debris.

The screen consists of a row of aluminium electrodes each about 14 ft. long extending to 3 in. from the bottom of the channel, with two electrodes, 16 ft. apart, 7 ft. downstream from the main screen. A pulsating supply is applied across the electrodes. All fish behave normally after leaving the electrified zone.

The Industrial Gas Load

By C. G. BROOME

From a Presidential Address to the Yorkshire Junior Gas Association

IT is 50 years since the first provisional committee was founded to formulate the rules of a Yorkshire Junior Gas Association. What vast changes have taken place within our Industry and our Association during the past half-century! Some there are who believe that not all the changes have been for the best, and to some extent they may be right. But, as I shall try to show, many of the changes have been advantageous. In 1913, when I joined the Sheffield United Gas Company, the working week was 60 hours and a new recruit received the princely sum of 5s. in wages—and it was considered a privilege to be accepted into the ranks of the 'gasmen.' At that period a gas fitter received a wage of 37s. per week, and was one of the highest paid of all the craftsmen. I need not mention the changes which have taken place in the conditions of employment within our industry since that day.

As an apprentice gas fitter I saw the installation of furnaces for file forging, cutlery forging, steel annealing and lead bath furnaces, and sugar boilers. Often I was amazed to see the many different appliances I helped to install. Then came the outbreak of the 1914 war and with it the working week was shortened and I was able to attend evening classes which were only an extension of the day school classes, not specialised subjects as we know today, and during the early part of 1916 I was given the opportunity of working in the furnace department. Thus I started in what was later to be known as the Industrial Gas Department of the Sheffield Gas Company.

What was happening during this period in other areas? Glasgow, I believe, was the first gas undertaking to set up a department to deal exclusively with industrial gas in the charge of J. McIsaac. This department included a model foundry complete with gas-fired crucible furnaces and a heat treatment shop. Soon followed Birmingham with Dr. C. M. Walter in charge, and Leeds was not far behind. Such were the foundations on which the present industrial gas section of our industry was built.

The 1914-18 war gave an impetus to the use of industrial gas that no other event could have done. Many new uses for gas were created, but there was no time for refinements. Then, with the ending of hostilities, came a change from war production to peacetime projects. Gas no longer was required to further the production of munitions, but it had become an essential fuel in all industries then engaged in the struggle to sell consumer goods in the world market; cost of production was an important factor and the refinements to gas-fired appliances became of paramount importance. The staffs of the furnace departments of the industry were called upon to improve the efficiency of the appliances in use and by co-operation with the furnace manufacturers, great progress was made.

I have glimpsed the 'good old days,' but the greater number of those wishing for the good old days are those whose path has been smoothed by modern ideas, by the encouragement of those in authority, and who have put a wishbone where backbone ought to be. Those who, in spite of all the opportunities that modern ideas in our industry provide, are still dissatisfied, fail to appreciate the fact that what is worth having is worth working for.

In the sphere of education vast changes have occurred. No longer are the universities closed to all except those whose financial position enabled them to enter. Entrance to the university today is by ability to absorb and benefit by learning; the State will provide the required monetary grants if need be. So it is in our own industry. The means are there for any junior to study for his technical qualifications at very little, if any, cost to himself. In some cases time is allowed off from work to attend classes without any loss. In common with all industry, hours of work are less, giving all more time to follow whatever studies they desire.

With the advance of engineering knowledge, many jobs—for example, those in a retort house—are being done mechanically where they used to be carried out by hard manual labour. Technical information is readily available on almost any subject. There are many more opportunities for advancement today owing to the growth in the total sales of gas and because at long last the industry is becoming conscious of the value of the industrial load to the economies of the undertakings.

Some idea of the growth of industrial gas can be obtained if I quote the figures given by Colonel Sir Harold C. Smith, Chairman of the Gas Council, at the Industrial Gas Conference held in Birmingham in May last year. He stated that there are only 114,800 industrial consumers, yet between them they used 25% of the total gas sold in Great Britain in 1951. In 1952, out of a total of 2,452,365,000 therms sold, 111,800 industrial consumers used 634,051,000 therms, 25.85% of the total. Surely these consumers are, in the words of Mr. J. Walker, Director of the Morgan Crucible Company, Ltd., 'a spreader of the oncosts.'

The Yorkshire Copper Works have long appreciated the value to them of gas as an essential fuel in their production. In 1913 these works consumed approximately 68,000 cu. ft. per year. In the year ended March 31, 1952, the consumption was 370,431,000 cu. ft., and up to the end of February, 1953, the consumption was 370,477,000 cu. ft. The above figures surely justify the decision taken by the Gas Council to appoint an Industrial Gas Development Officer to their staff.

Finally, a word about our Association. After the change to nationalisation many felt that we might possibly lose our identity, but time has only strengthened our position. Drawing our membership from the personnel of two area boards, we are doubly blessed. Both boards have shown in no uncertain manner their willingness to further the work we try to do. They are at all times ready and eager to grant us facilities for meetings, to provide hospitality, and to spare time to join us in our meetings. It is up to all of us to show our appreciation by giving of our best to the Association.

SCOTTISH INDUSTRIAL PRODUCTION

THE seventh annual White Paper on Industry and Employment in Scotland (Stationery Office, 2s. 6d.) estimates that industrial production in Scotland in 1952 suffered a setback of about 1% compared with an average of 3% for the whole of the United Kingdom. Coal output in 1952 fell by 534,000 tons from the 1951 figure, and output per man-shift overall declined from 22.2 cwt. to 21.2 cwt. Recruitment to the mines rose sharply during the year, the Scottish Divisional Coal Board aiming at a labour force of 82,770. This was exceeded by 3,000 and recruitment of inexperienced adults was stopped.

The fall in production of crude steel which started in 1951 was halted in 1952, and 2,132,726 ingot tons were produced, compared with 2,114,800 tons in 1951, and 2,426,000 tons in 1950. The shortage of scrap and other raw materials affected the shipbuilding industry, which completed 454,723 gross tons of new merchant shipping, 36% of the total United Kingdom output, compared with 490,943 tons, 36.5% of the total, in 1951. The aircraft industry was very busy last year, but there was a big drop in the production of locomotives, due mainly to the shortage of steel, and a decline in the manufacture of heavy goods vehicles and service vehicles.

Unemployment in Scotland, which in February of last year was nearly 76,000, was greater than at any time since 1947. There was some short-time working and although there was an improvement in the consumer-goods industries towards the end of the year, the figure in December stood at 73,000.

Over 2 mill. sq. ft. of factory space was completed in Scotland in 1952, and by the end of the year about 5,500,000 sq. ft. was under construction.

A new Digest of Scottish Statistics also obtainable from the Stationery Office (4s.) gives information about the economic situation in Scotland hitherto unavailable.

FIFTY-THREE INDUSTRIALISTS and experts in the field of industrial management from nine European countries—Austria, Belgium, Denmark, France, Germany, Italy, Norway, the Netherlands, and Turkey—and the United States met in Paris on April 15, under the auspices of the Organization for European Economic Co-operation, to exchange views and discuss measures for improved industrial management in Europe. The two-day meeting followed a number of visits of European industrial experts to America during which they were able to study modern methods of industrial management. Representatives of the various national productivity centres, trade unions, and several other organisations, also attended.

Scottish Association of Gas Managers

Presidential Address

of ROBERT COWIE, Hawick.

I PROPOSE to consider the outlook and work of a gas manager in these present days. Just how useful that will be I do not know, but it seems to me that in the hurly-burly of the change and development which is taking place it is a good thing to take stock.

Some 80% of the members of the Scottish Association of Gas Managers are responsible for undertakings selling 250 mill. cu.ft. per annum or less. No reflection on anyone is intended when I suggest that those in charge of larger undertakings may have found the impact of nationalisation less disturbing than have their brethren to whom I refer. In the nature of things their outlook would be broader; since vesting date they have had regular opportunities of exchanging views with their colleagues and the advantage of closer contact with headquarters.

If it is true that these last few years have been disturbing, I hope it is also true that they have been stimulating. It would be churlish not to express appreciation of the fact that the change has been gradual, and to acknowledge the consideration which has been shown. To unify nearly 200 separate undertakings which have existed as entities for over 100 years is a tremendous task. All the more so in a country so noted for rugged individualism as Scotland is by tradition and by history. The clan system in Scotland was very different from the feudal system of England, and this has left its mark on the national character. I think it is to the credit of all concerned that the strain which was apparent during the first few months has disappeared so soon. Someone has said that healing is a matter of time, but it is sometimes also a matter of opportunity.

Learning the Team Spirit

Colonel Sir Harold Smith acknowledged at our meeting last September that consumers had been largely unaware of the changes which have been taking place, and this in itself is no small achievement. The change in outlook and habit of thought required of gas managers is, of course, mainly due to the fact that formerly each of us formulated a policy for our undertaking, and made recommendations accordingly to a board or committee which was composed for the most part of local laymen. It is a very different thing indeed to submit schemes to fellow members of our Association, particularly in view of the proverbial difference found in expert opinions. In former days a gas manager consulted whom he would; put his theories to the test, and stood or fell by their success or failure. Now we are having to learn the team spirit, either as members of the team or as leaders, and new bonds of fellowship are being forged wherever a true spirit of unselfish service is found. I believe this spirit to be an absolute essential for efficient service to the community. Our working hours are such a large part of our life that it is a pity if they are not satisfying in more than a material sense.

The word integration has had quite a vogue in recent years. Actually, the process has been going on all the time and was indeed inevitable. It is many years since our first major integration scheme took place in Lanarkshire and administrative integration was carried out by the former holding companies. Nationalisation has accelerated the process. I notice that one of the dictionary meanings of the word is 'to complete an imperfect thing into a whole by the addition of parts.' I suggest that mental integration is a necessity to the success of physical and administrative integration. In spite of shortages of material and staff, physical and administrative integration are easy compared with this mental adjustment, for none of us likes to admit to gaps in his mental outlook or capacity. I think the time has passed, however, when any of us need deceive ourselves that integration, physical, administrative, and mental, is not necessary, and honesty compels many of us to admit that we have improved our technical knowledge and professional practice as a direct result of the changes which have taken place.

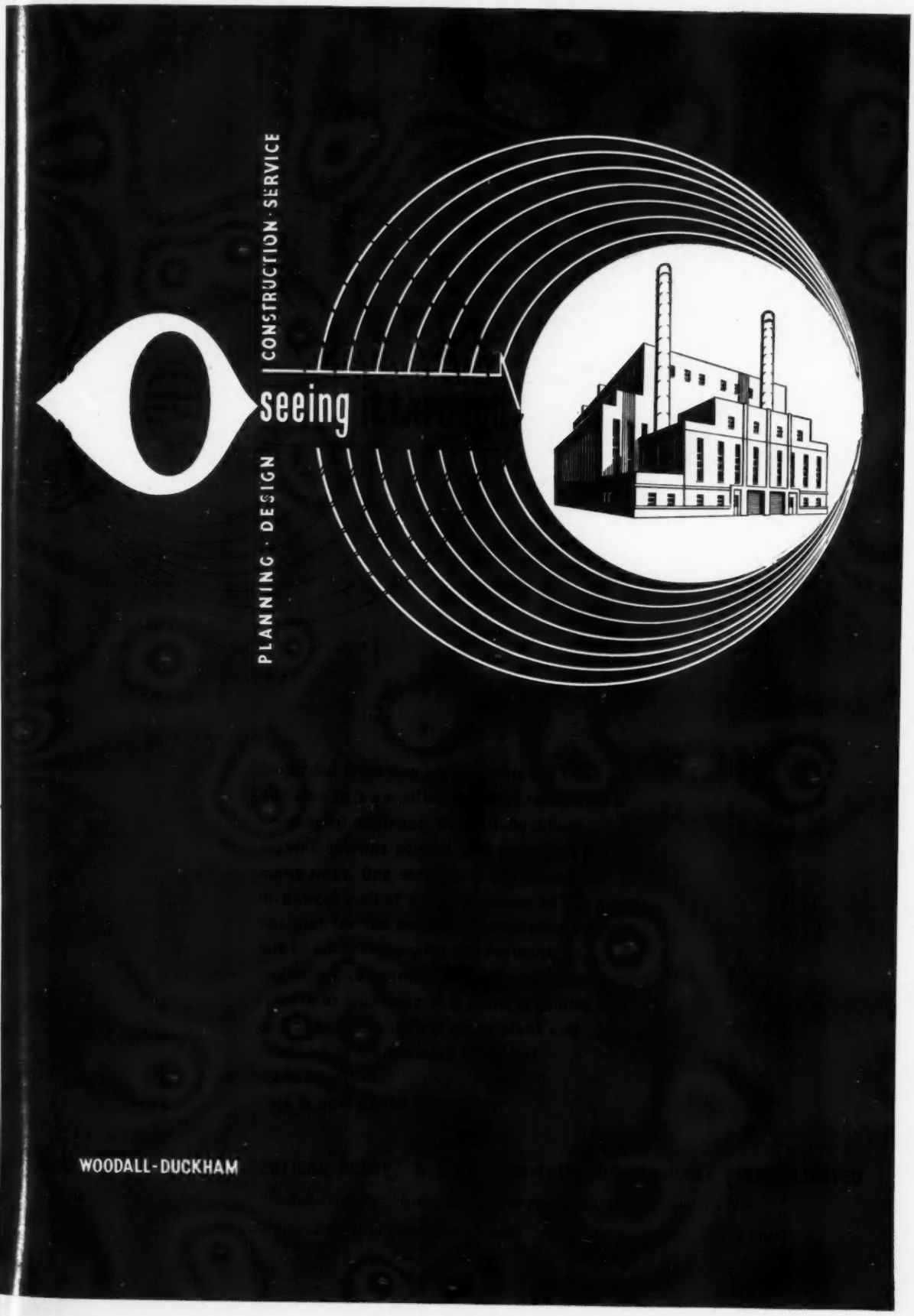
At an early meeting after vesting, the Chairman made reference to our title. Formerly, we were proud to style ourselves engineers and managers; after vesting we became district managers, and Sir Andrew made it quite clear that, of the two aspects of our work, he regarded the managerial one as the more important. If I recollect correctly, he seemed to suggest that, while technical training could be acquired, management demanded inherent qualities. I do not know that we followed him all the way—we may have been prejudiced. I for one had a preconceived idea that a general engineering training was the best possible training for the management of a gas undertaking, but it must be readily admitted, however, that whatever bias our basic training may have, the gas manager, especially of the smaller works, is very much 'a maid of all work.' This variety, which makes the job interesting and satisfying, can, in these days of increased tempo, added 'paper work,' and finicky administrative detail, reduce it to a 'Jack of all trades and master of none' job. This state of affairs is happily being remedied by the introduction of a measure of functionalisation under sub-group working. Increases in staff which this is liable to bring about will be offset by savings in other directions, an extension of business, and considerably improved service to the public.

The increased attention being paid to the administrative side of our profession is reflected in the number of non-technical papers which have been read in recent months at district meetings in other parts of the country. Many will have read Mr. McDonald's inaugural address at the Manchester District meeting. After referring to the provisions of the Gas Act in respect of joint negotiation, education, and welfare, he went on to say: 'Whatever stress we have formerly laid on the training of a gas engineer, it is apparent that all who aspire to any form of managerial function must be prepared to add a third accomplishment after he has completed his professional training—namely, that of being able to handle men and train them for the duties they are to carry out. Although it is an obligation of the Gas Council and the area boards to make the provisions which I have mentioned, it is the gas engineer who has to put them into operation; and therefore it becomes a delegated obligation on him, as it is he who will use these provisions as tools to obtain better results.'

Persuasiveness and Psychology

In the days of the dragooning type of manager, technical training by itself may have been sufficient, but dragooning is out of date and the successful manager must aspire to the persuasiveness of the salesman and the skill of the psychologist. In recent years, due to lack of personnel, it has not been a case of fitting the right kind of pegs into the right kind of holes, but of finding pegs of any kind and trying to shape them to fit. Apart from this, however, it falls upon the manager to do much of the training of his staff personally. Even for those grades undergoing an approved technical course complementary training and guidance are most essential.

At this point I must refer to the Institution of Gas Engineers, to whom we all owe so much directly and indirectly, particularly in the matter of education. The new regulations have many advantages and appear to cover the varied requirements of our industry in a remarkable way. By setting standards at different levels and, at the same time, providing a progressive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course to full membership of the Institution, they should prove of considerable value to employer and employee alike; while the uniformity with the requirements of allied institutions should assist recruitment of personnel from other industries where that is desired in the interests of efficiency.

We can think of our technical training as a ladle with which we can dip into the vast pool of specialised knowledge which exists for our use in the technical Press (and no industry is better served than we are in this respect), and in the Transactions of the Institution and kindred associations. Although it may have been laboriously fashioned, our own particular ladle may be small, or leaking, or even the wrong shape, and so we may need to ask someone else to take a dip into the pool on our behalf. That is one of the advantages of meetings like this and of integration and unified control. If we don't know, we can readily find out and we need never be diffident if we remember that 'the great end of life is not knowledge but action.' We hear much of incentives nowadays, but surely the most powerful incentive to efficiency is just the pride and satisfaction in being equipped to do a job well and having something to show at the end of the day. It is part of the responsibility of management to provide just these incentives to colleagues irrespective of their position. There are few things more disheartening than to have this just reward filched and nothing more encouraging to the recipient or satisfying to the donor than a modicum of magnanimity in these matters.

Fears Unjustified

Prior to nationalisation, and since, fear that the new régime would result in the stifling of initiative was widely canvassed. So far as I have been able to judge, however, there is no evidence that these fears were justified, and in this connection it might be worth while to quote the telling comment with which Mr. W. K. Tate concluded his recent address to the joint meeting of the Juniors in Glasgow. The address dealt entirely with civil engineering work and problems, but the conclusion has, I think, a wider application. He said: 'To me, personally, our experiences have emphasised three truths which surely apply to any task, whether it be the selling of a gas appliance, the preparation of some new administrative routine, or indeed anything else. Firstly, to make sure of your basis by every possible means. Secondly, never to assume that you can depend on what you do not know but can only guess, and thirdly, always to be ready to adapt yourself with a flexible and pliant mind and outlook to changing conditions. Of these three, the last is perhaps the most important, and it must never be forgotten that there are many other and better ways of overcoming obstacles and gaining the desired end than the mere retention of preconceived ideas.'

When we met last September we were awaiting, with some degree of optimistic anticipation, the publication of a report on a national fuel policy from the Committee which had been set up under the Chairmanship of Viscount Ridley. For many years the gas industry has been trying to convince the nation that in the carbonisation of coal lies the answer to the conservation of our most valuable indigenous product. One remembers the late Sir David Milne-Watson's plea for a proper recognition of the value of the gas industry and his able argument in support of the formation of a Ministry ot Fuel and Power years before such a Ministry came into being. In 1949 we read Colonel W. M. Carr's proposals and wondered why no one took them up. Later, and more encouraging, came national fuel plans from persons outside the gas industry such as Oliver Lyle's paper to the Institute of Fuel and Gerald Nabarro's 'Ten Steps to Power.' Incidentally, if you wish to read an interesting account of the effect the implementation of these plans would have on the gas industry, I commend Mr. Tom Cameron's Presidential Address to the Scottish Junior Gas Association (Eastern District) to your attention.

It was reasonable to anticipate that the Ridley Committee would produce a plan calling for the extended development of the gas industry in order that it might take what so many of us imagine to be its proper place in the provision of fuel service to the nation. Such a plan would tax our resources and keep the industry fully extended for years, and the best interests of the nation would seem to demand co-operation between the fuel industries, especially in our present economic circumstances. It was natural to think that a committtee, taking all the available evidence and making an objective report, could do no other than emerge in the rôle of a fairy godmother to the Cinderella gas. Those of us who expected this were disappointed. Upon reflection we may still shake our heads sadly—but are we really surprised? Three reasons might be suggested to account for the non-appearance of a fuel charter. Firstly, due to external factors arising from world conditions, the problem is constantly changing; secondly, it is very complex; and thirdly, there is a widespread aversion to coercion or compulsion in any shape or form.

At any rate, we have been provided with the most complete and authoritative survey of the fuel industries ever produced. Every one of the 240 pages is worth our study. The Committee was representative. To add that it was well-informed is an understatement. It is difficult for us to take up an objective attitude and, therefore, good for us to see ourselves and our friends in the fuel business 'as ithers see us.' Of special interest is Appendix XI., particularly the Gas Council's contribution. Here we have authoritative and up-to-date information on our own industry which is of infinite value in our daily work. What we do not know is when and in what way the Government, through the Ministry of Fuel and Power, will implement the report. It has been suggested that effective financial sanctions could be applied through the proposed Specialised Tariffs Committee in respect of fuel prices to the public and/or through a Joint Fuel and Power Planning Board in respect of capital expenditure. In this way, at long range from the consumer, and at high level, sanctions might be more acceptable to the public without being any the less effective in operation. I must not stray into these political realms, however, but as an ordinary gas manager interested in maintaining his load I cannot help feeling that it is unfair that a national industry should be allowed to exploit a monopoly and thereby undercut a competitor who is providing a service no less important to the nation, and, as has been amply demonstrated on many occasions, is much less greedy in its demands on raw coal and capital expenditure.

Continued Competition

In regard to the lack of major specific recommendations in the Ridley Report, I feel tempted to misquote a well-known text: 'The trumpet has made an uncertain sound, we shall prepare ourselves for the battle.' There is nothing uncertain, however, about recommendation No. 38 which reads as follows: 'Within an appropriate framework of prices and tariffs, competition between the gas and electricity industries should continue.'

However much we deplore competition in theory, in prac tice it is ever with us in some form or other. I must confess that recent restrictions in promotional advertising have not only been irksome, but savour of organised hypocrisy. In the matter of obtaining a fair share of Government support for materials and capital, it appears that there has been some competition and that our competitors have had a fair measure of success.

Since my junior days when I decided that I had studied as much engineering as I could usefully apply and took up the study of advertising and salesmanship, I have been convinced that sales promotion was an essential part of our service. It was heartening, therefore, to read the foreword in the programme for the recent Sales and Service Conference in which Colonel Sir Harold Smith states: 'The most vigorously prosecuted selling campaign still provides a service to the public, for it is an obvious convenience for people to have a clear idea of what the gas industry has to offer and what new appliances are available. If we were to keep all our latest developments hidden behind the scenes, the public would have the right to say, "Why did you not tell us about these things?" We must not forget, too, that our object in making our selling plans is not to try to stampede the public into indiscriminate buying. That, I am glad to say, has never been the policy of the gas industry, and, if it were, it would soon recoil upon our heads. What we aim to do is to sell those appliances which will give their users the best service and the greatest amenities.'

May I venture to suggest that for many years there has been a tendency for some gas managers, at least, to devote a disproportionate share of their time and energy to the gas-works. No matter how keen we may be to have an efficient, tidy, and well-managed works, and rightly so, the consumer is not interested in the works—except indirectly in so far as it affects the price of gas. The gas board, as far as the public is concerned, is the man who reads the meter, the person in the showroom, the showroom itself, and the district manager. The members of the public, or at least the vast majority of them, are so accustomed to sales promotion in other industries, that they are apt to judge us on the quality of our advertising, our window displays and showrooms, and relate the impression these things make to the service itself, for indeed they are part of the service.

In our manufacturing process we have useful yardsticks to measure efficiency; fuel expenditure index, make per ton, cost per therm sold, and the like. These react promptly to changing conditions and make control correspondingly easier. On the district, similar yardsticks—*i.e.*, consumption per consumer, sales of appliances per consumer, and so on—operate under a much greater time lag, and for this reason the proper supervision of the service side requires more management time and not less. If this is true in normal times, how much more so is it true to-day, after 15 years, half a generation, of a sellers' market in gas and gas appliances. The sellers' market has gone with almost dramatic suddenness and we must either accept the inevitable decline or 'stir our stumps.' The greatest obstacle is the lack of personnel.

A Point of View

On this occasion all I am attempting to do is to give a point of view, my own inevitably, and perhaps a narrow one, but none the less sincere. For the past 20 years, in the district which I have had the honour to serve, sales and service have demanded of the manager and his deputy time and energy equal to the full capacity of one of them. In meeting this demand, I do not think that the management has lowered its professional status or stepped down in any way. I mention this because I feel that many of our members face the possibility of bulk manufacture and the consequent closing-down of their works with dread and a feeling of loss of prestige. I have difficulty in sympathising with this attitude because, sentimental attachment to the works apart, it is a most satisfying and absorbing part of the work to improve our service at the point at which it is translated into terms of human convenience and need, and where it demands just as much managerial skill and knowledge as does any other aspect of our industry.

We all suffer from the temptation to do the work we find easiest, and of course a gas manager's job is so varied, has so many facets, that it is the easiest thing in the world to become immersed in one or other aspect to the detriment of the whole. For many years the main preoccupation was in the works—'profits are made in the retort house' was the slogan, and carbonisation, fundamentally a simple process, claimed a large share of the time and attention of gas managers. The emphasis has changed and now there is a very real danger in these days that we will allow the demands of the organisation itself to consume an increasing proportion of our time and energy. These things are only a means to an end, that of giving the public service, and probably the greatest problem that the district manager has to face today is the proper division of his time and energy between these competing aspects of his diverse duties.

Nationalisation is imposing burdens at a much faster rate than it is conferring benefits. A time lag of this kind is inevitable, but it is reasonable to hope that in time the benefits will catch up and maybe in the future the technical services available for the district manager will allow him to devote more attention to the service side of the work.

In all but the largest of our undertakings the maintenance of contacts with local authority officials, architects, builders, and the like is a function of the district manager, which, if it is to be done adequately, calls for a large expenditure of time and energy. There is a need here, too, for close contact with our neighbours, as our boundaries, even group boundaries, do not always coincide with local government ones.

In passing, it is also worth mentioning that while it is a fine thing to get the authority, or architect, to specify coke and gas appliances, we must satisfy the consumers if the business is to be continuous. In a lot of 167 temporary houses of which I have knowledge, 68 of the 'approved' space heating stoves have been replaced by open fires—approved by the housewives.

I do not think that this is the time or place to go into detailed arguments on the subject of sales or service. The pages of *Gas Service* and similar publications give us more inspiration than we can translate into practice.

GAS SCRUBBING PLANT

SOME notes on Pease-Anthony scrubbers, introduced by the Power-Gas Corporation, Ltd., of Stockton-on-Tees, were given in the issue of the *Engineer* of April 17. These platns are widely used in the United States for cleaning gases, and are now being used on several applications in this country.

'There are two main types of scrubbers, the first to be developed being the 'cyclonic' spray, which has now been in use for nearly twenty years. In a normal installation of this design duty gas enters tangentially at the base and spirals up through a fine spray made by suitable nozzles mounted on an axial manifold. The centrifugal force of the rotating gas spins the fine liquid droplets out to the wall of the tower and the dust particles are wetted by collision as they pass through the spray zone. The finest wetted particles and spray droplets are thrown out in the upper section of the scrubber. This scrubber, with suitable nozzles, liquid pressures and quantities, is very effective for removing particulate matter down to about 1 micron in size, and it has been used in such applications as lime kilns, boiler plants, superphosphate dens, etc.

For treating finer dust and fumes which are not dealt with completely by the cyclonic scrubber, the Pease-Anthony venturi scrubber was developed. This scrubber is based on the principle of fine atomisation of liquids by high-velocity gas streams. In it the scrubbing liquid is introduced into or just ahead of a venturi throat under low pressure and is distributed to give a fairly complete apparent curtain of water across the throat. The dirty gas, at a velocity usually in the range of 200 ft. to 300 ft. per second, collides with the curtain of liquid at the venturi throat, where the liquid is briefly but violently accelerated and disrupted. The fine particulate matter in the gas is wetted by the finely atomised liquid droplets and considerable coalescence of droplets occurs in the diverging section, resulting in drops of liquid large enough to be removed from the gas stream by centrifugal force.

The coalescence is thought to be mainly due to collision and impaction, but diffusion or molecular bombardment, electrostatic charge effects and condensation may all be involved.

The gas is normally drawn through the system by an induced draught fan, usually placed after the cyclonic separator, where it is dealing with a reduced volume of clean gas.

Commercial installations are operating with liquid rates in the range of 2 gal. to 10 gal. per 1,000 cu. ft., and with varying velocities giving pressure drops ranging from 6 in. to 30 in. W.G. These installations include steel furnaces, non-ferrous metal furnaces, copperas, roasting phosphoric acid plant, detergent spray driers, etc.

When treating hot gases it is preferable to employ a saturation chamber before the venturi, which serves to cool the gas and also establishes more constant conditions at the venturi in cases where temperature fluctuations occur during a process. Normally the venturi is followed by a dry cyclonic separator, but for some difficult cleaning problems it may be necessary to use a cyclonic scrubber in series with the venturi to obtain a satisfactory effluent.

While the venturi and cyclonic scrubbers have been used sucessfully in many different applications, there are cleaning problems where preliminary experimental work is required to establish the optimum conditions for scrubbing. To deal with such problems the Power-Gas Corporation has made available a pilot plant, which can be dismantled for transport on a road lorry, consisting of a venturi scrubber and cyclonic scrubber in series. It is completely self-contained with its own fan and water pump and tests can be carried out using either of the two scrubbers or both in series. With it water quantities and gas velocities can be varied to determine the best possible conditions for scrubbing.

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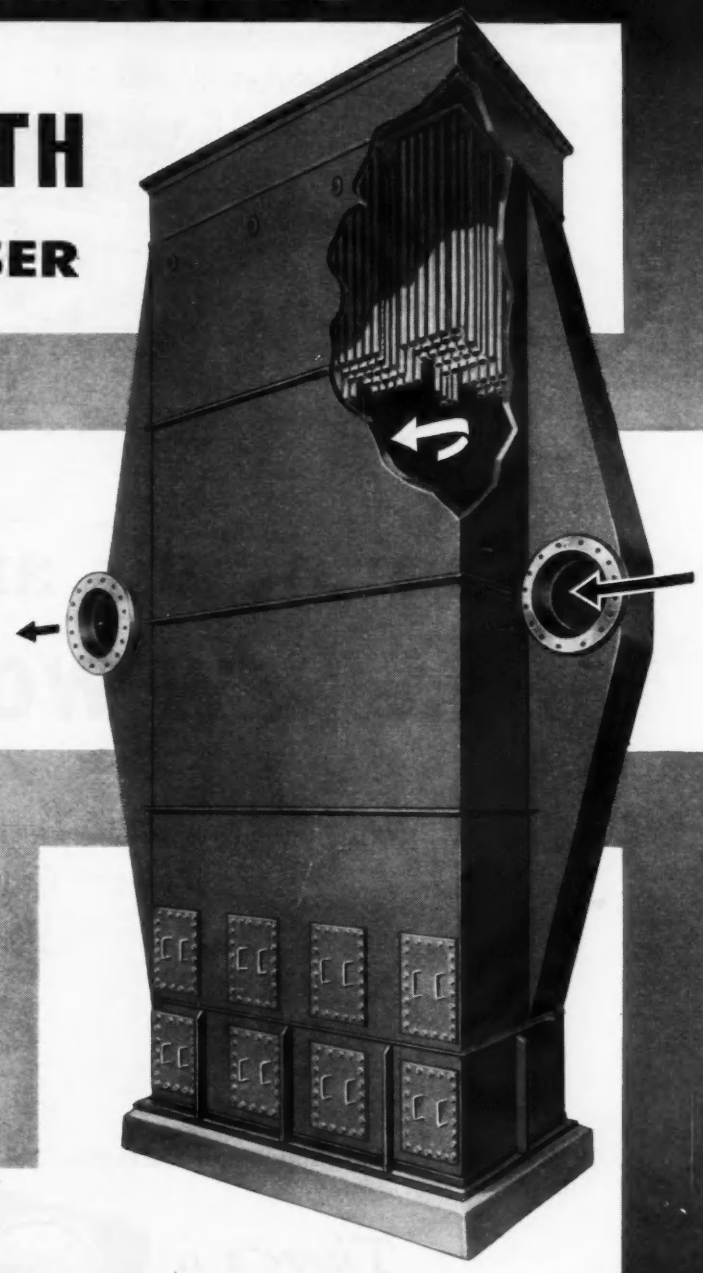

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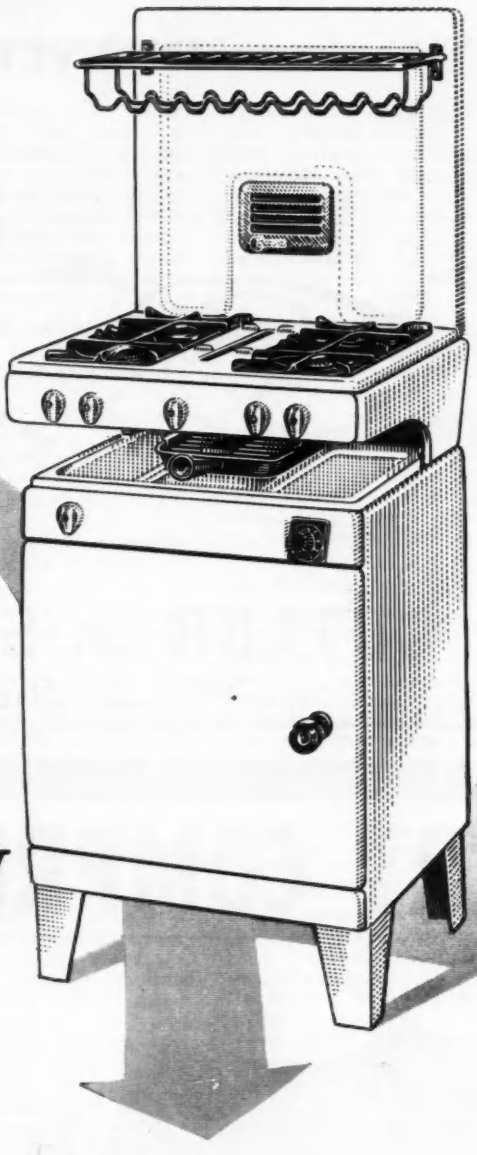

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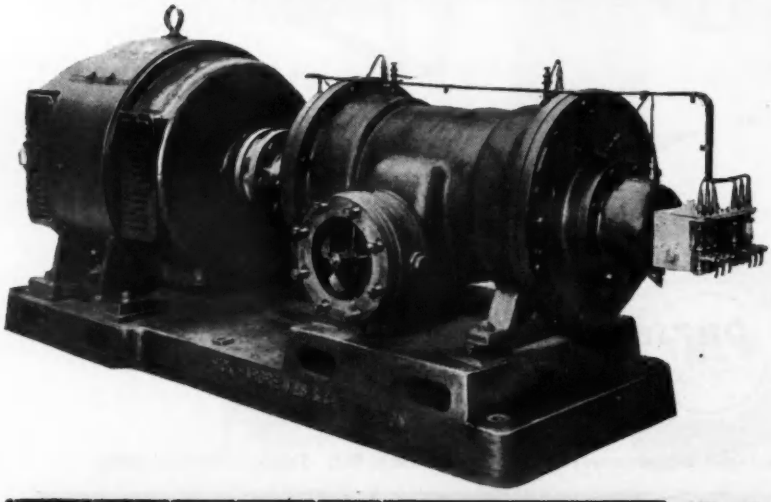

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H.106A

Germanium in Coal Ash

By K. STEWARD,

Liverpool Group, North Western Gas Board.

Paper to the Manchester District Junior Association of Gas Engineers

GERMANIUM is a rare metal belonging to the fourth group (sub-group B) of the Periodic Table comprising, in particular, the elements carbon, silicon, germanium, tin, and lead. Historically, the element 'ekasilicon' was predicted by Mendeleeff and its general physical and chemical properties foretold, but no such element was discovered until 1886, when Clemens Winkler[1] was analysing the mineral 'argyrodite,' his analysis resulting in the discovery of an element whose properties were in agreement with Mendeleeff's postulation and he proposed the name 'germanium.'

Germanium is found in some minerals, generally as the sulphide, the principal sources being:—

(a) Argyrodite, occurring at Freiberg, in Saxony, containing about 6.9% germanium.
(b) Germanite, occurring in South Africa, containing about 6% germanium.
(c) Canfieldite, occurring in Bolivia, containing about 6.6% germanium.
(d) Ultrabasite, also from Freiberg, containing 2.2% germanium.
(e) Zinoblende from various sources and, to a smaller extent, in numerous other minerals—for example, columbite, tantalite, etc.

The above ores are rare in occurrence and the richest sources now known are the spelter residues from certain American zinc ores[2], especially originating from Wisconsin and Missouri. It collects in the spelter retort residues since the oxide of germanium is easily reduced by carbon at red heat and the metal is only slightly volatile at 1,350°C. In the zinc oxide furnaces germanium burns to germanium oxide passing off with the dust to the bag houses. Although the zinc ores contain not more than 0.01% germanium the extent of its occurrence is fairly uniform and presents the most readily available source.

Presence in Coal Ash

In the late 'thirties, germanium was found in coal ash, occurring to the extent of 1% in some Russian coals. Latterly, the search for germanium was extended to British coals,[3] the work being carried out by the Fuel Research Board, and it was found that the most promising area for coals containing a reasonable amount of germanium was that of Northumberland and Durham, and the most promising seam, the yard seam (Hartley Colliery). The coal had to be cleaned prior to investigation so that it gave only about 2% ash in order to remove the non-germaniferous mineral matter, and ashes were thus obtained containing 0.3 to 0.5% germanium dioxide, a relatively high concentration for such a rare element. Ashes, which were analysed, had been prepared in a laboratory muffle furnace and it became necessary to obtain larger quantities of ash for research. Coal was then burned in a domestic grate, but the ashes were found to contain only 0.05% germanium dioxide. The reason for this loss was that coal burned in this way first undergoes limited oxidation with the air passing through the fuel bed, carbon monoxide being formed and yielding a reducing atmosphere while burning to carbon dioxide in the secondary air supply above the fuel bed. Laboratory experiments confirmed that germanium was volatilised from coal by combustion in a reducing atmosphere presumably after reduction to a germanous compound.

Thus, there are obviously two ways of obtaining relatively volatile elements from coal:—

(a) By incinerating the coal in such a way that the volatilisation is discouraged, or
(b) Burning the coal under reducing conditions with insufficient air passing through the fuel to encourage gasification, the elements sought being condensed from the gases.

Volatilisation of the more volatile elements from coal is almost complete in some industrial boilers and all producer plants, condensation occuring in the flues and pipes as the temperature falls. Morgan and Davies[4] examined a large number of boiler flue dusts and producer dusts and, in cases where Durham coal had been combusted, the dusts mostly contained from 0.2 to 0.9% germanium, and these investigators estimated that the boiler and producer dust of the country could be made to yield 2,000 tons of germanium, along with 1,000 tons of another rare element, gallium, per annum.

After the discovery of germanium present in flue dust, various area boards throughout the country were approached by Elgar Laboratories and Johnson Matthey & Co., Ltd., who extract and refine the material, with a view to obtaining samples of dust for analysis, and if suitable, supplies of the germanium-bearing flue dust. The principal reason for the desirability of extraction from flue dust is that germanium is imported from the U.S.A. and it is intended to replace these dollar imports by the home production of germanium, the material being urgently required for development in the radio field and radar equipment.

Uses in Industry

In scientific industry germanium has become important due to recent discoveries which have opened up a wide field of application in radio. It belongs to a group of materials, known as 'semi-conductors' which have electrical properties lying between those of metallic conductors and those of insulators. One property of these materials is that when placed in contact with a sharp pointed metallic conductor, the assembly acts as a rectifier and thus will conduct electricity in one direction but not in the other. An example of this is the old fashioned 'cat's-whisker,' in which the semi-conductor was a silicon carbide crystal. Germanium shows these rectifying properties to a much greater degree than silicon carbide, forming a stable and compact rectifier for medium frequencies.

It is interesting to note that germanium of a high degree of purity is required for this application but, at the same time, a trace of impurity must be present to enable it to conduct at all. To form an effective rectifier the impurity must be less than 1 part per million but must nevertheless be present as a trace to render the material conducting in the forward direction.

More recently it has been found that by adding another 'Cat's-whisker' to a germanium plate, and applying a central voltage, the conducting properties can be modified and the plate acts in a similar manner to a triode valve. This device has been christened a 'transistor' in America. This last discovery is of immense importance in the design of radio and telephone circuits, and other possible uses are in component parts of guided missiles and airborne radar and, even, hearing aids, all this lending impetus to the search for new sources of germanium. The great advantage of these germanium 'transistors' is that no heater current is required as in a thermionic valve and they will function on small batteries.

Methods of Determination

Various methods are available—gravimetric, volumetric, and absorptiometric

Gravimetric. Germanium is converted to germanium tetrachloride (volatile) which is steam distilled and reconverted to germanium dioxide. The North Western Gas Board, having entered into contract with Elgar Laboratories for the sale of germanium-bearing flue dust, made available a method of determination employed by this firm and this is now in use in the Liverpool Group. Although rather lengthy, the method has been found to give very reliable results.

The finely ground dust sample (10 to 20 grammes) is treated with 250 ml. 6N hydrochloride acid in a reaction flask connected via a water cooled condenser to two receivers, in series, cooled in an ice bath and containing 50 ml. of distilled water. Chlorine is bubbled through the apparatus from a cylinder, the determination being conducted in a fume chamber, and the reaction flask is gently heated. The distillation is continued until 100 ml. of reaction mixture has distilled, and at the end of this period it may be assumed that all germanium volatilised as germanium tetrachloride (B.P. 83°C.), being absorbed in the water.

After careful washing down of the condenser and delivery tubes, the distillate in the receivers is saturated with hydrogen sulphide, converting it to the sulphide GeS_2. The sulphide is then filtered (No. 540 Wattman paper), dissolving in ammonia any particles adhering to the flask receivers and reprecipitating with hydrochloric acid, filtering when cool. The precipitate is washed with 1.5N hydrochloric acid and then dried at 60°-70°C., prior to ignition apart from the filter paper. It is then treated with 6% hydrogen peroxide (5-10 ml.) and digested on a water bath. When dry, heat gently to burn off elementary sulphur, adding a few drops of concentrated nitric acid, evaporating and sintering gently again. Repeat this operation until the contents of the crucible are white and no white fumes (sulphuric acid) appear any longer. Then ignite to constant weight at 900°C., weighing as germanium dioxide.

There are certain precautions to be taken in this determination and it should be borne in mind that, in general, germanous (valency 2) compounds are more volatile and less stable than germanic (valency 4) compounds. Thus, in the above method, if the filter paper and sulphide precipitate are ignited, there is a tendency for the germanic sulphide to be reduced to germanous sulphide, which is volatile at 430°C. Also, the germanic sulphide is not particularly stable, subliming at 600°C. Thus it is preferable, in our experience, to separate the precipitate from the paper, igniting the latter, and then treat the paper ash and sulphide precipitate immediately with hydrogen peroxide. In the digestion which follows, care must be taken to guard against loss due to 'spitting,' this being reduced to a large extent by part covering the crucible with the lid. Also, in the final ignition in the muffle furnace, care must be taken to prevent reducing gases affecting the germanium dioxide.

It was found necessary to perform a blank on the hydrogen peroxide used during the final oxidation, there being a tendency for a residue to remain, increasing the apparent weight of germanium dioxide—found to be of the order of 0.0008 grammes per 10 ml. of 6% hydrogen peroxide used.

The stoppers and rubber connections are attacked by chlorine and have to be replaced at intervals when leaks are detected (using ammonia bottle), but in our experience the main attack occurs at the stopper of the reaction flask, although it proves efficient for 20 or 30 distillations.

Results obtained on four separate samples of flue dust from the necking box of the Woodall-Duckham retorts at the Garston works, Liverpool, gave individual results of 0.165, 0.166, 0.167, and 0.166%, which indicates the scope and accuracy of the method.

Another method of determination, as used by Johnson Matthey Co., Ltd., is simpler and differs basically in that germanium dioxide is precipitated as a tannate, which is filtered off and oxidised to germanium dioxide.

Finely ground dust (2 grammes) is treated in a nickel crucible with sodium peroxide, the melt being leached with water, and the solution transferred to a distilling flask, connected via a water condenser to two receivers, in series, containing a small volume of water. The second receiver is connected to a vacuum line and a gentle stream of air is drawn through the apparatus.

5 ml. 10% sodium chlorate is added to the solution in the distilling flask and concentrated hydrochloric acid is then slowly added to neutralise the solution, a further volume, equal to that of the solution, being added. The solution is then heated, distillation being continued for 30 min. with occasional additions of sodium chlorate. A further 100 ml. hydrochloric acid is added and the distillation continued for a further 15 min. The contents of the receivers are then combined, neutralised to ammonia, and just acidified with acetic acid. A solution of tannin (1.2 grammes) is stirred into the solution and, after standing 15 min., the precipitate is filtered by suction, washed free of chlorides with 3% ammonium nitrate, dried, and transferred to a crucible, igniting as in the Elgar method.

This method is more rapid and simpler than the Elgar method but the pH has to be carefully controlled and the rate of distillation has also to be watched as other inorganic matter (iron, for example) may be carried over if the distillation is too rapid. At Liverpool the Elgar method has been used principally owing to the contract with this firm, and has been found to be quite workable when there are numerous samples placed on test consecutively, thus reducing the time taken when samples are determined individually.

Volumetric. Standard sodium germanate solution is required, being prepared by fusing 1.4408 grammes of pure ignited germanium dioxide with sodium carbonate, dissolving the melt in hot water, acidifying with dilute sulphuric acid, boiling to expel carbon dioxide, and eventually diluting to 1,000 ml.

Standard sodium hydroxide is also required, approximately 0.2N., titrating against the standard germanate solution, using bromocresol purple indicator, to a pH of 6.2 as indicated by colour comparison with a pH 6.2 buffer solution. Then add 10 grammes of mannitol and titrate again until pH 6.2 is reached. From these figures the germanium equivalent of the sodium hydroxide solution can be calculated.

The sample solution to be tested is converted after prescribed treatment to sodium germanate, and may then be titrated against the sodium hydroxide as in the standardisation titration, and thus the germanium content estimated.

Absorptiometric.[6] Special reagents are required—standard sodium germanate and phenylfluorene solutions, the germanium solution in hydrochloric acid distilled, the distillate treated with gum arabic and phenylfluorene before measuring the absorption by means of a Spekker absorptiometer. The standard sodium germanate solution is necessary to give a germanium-absorption calibration graph.

Results of Investigations

Samples of flue dust from various positions in the carbonising systems of the works in the Liverpool Group have been analysed, the flue dusts being grouped into four main categories:

(a) Flue dusts removed from retort settings. (For convenience, all dusts from producer gas plant and retort settings are included here).
(b) Flue dusts from waste gas flues.
(c) Flue dusts from waste heat boilers.
(d) Flue dusts from solid fuel boilers.

Works	Plant	Date	Source of Dust	% Germanium
Athol St.	Vert.	May, 1952	Retort settings, CO flue	0.01
Garston	Vert.	June, 1952	Retort settings, cross-under flue.	0.12
Linacre	Vert.	June, 1951	Retort settings dust-catcher	0.01
Prescot	Vert.	June, 1951	Retort settings 1st combustion chamber	0.62
Ormskirk	Horz.	June, 1951	Waste gas flues	0.40
Prescot	Vert.	June, 1951	Waste gas flues	0.30
Linacre	Vert.	Aug., 1952	Waste heat boiler 5 ..	In 0.44 Out 0.49
Linacre	Vert.	Nov., 1952	Waste heat boiler 6 ..	In 0.25
Prescot	Vert.	June, 1951	Waste heat boiler	0.45
Southport	Solid fuel boiler	June, 1951	Base of stack, Lancashire boiler.	0.01
		June, 1952	.. ..	0.10

From these results, it seems advisable to concentrate on sources (b), (c), and (d), particularly the waste heat boiler, but more results are required before a thorough and detailed conclusion can be reached upon the location of the richest germanium bearing dusts. The figures do, however give an indication of the most likely situations and may enable some tests and analyses to be conserved in individual cases.

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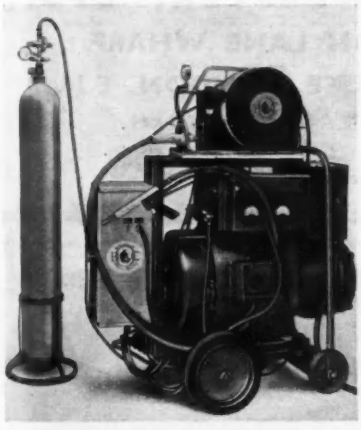
4. MORGAN and DAVIES. *Chem. and Ind.* 1937, 56, 717.
5. Handbook of Physics and Chem. (31st edition).
6. *Analyst*, 76, 905 (Sept. 1951).

TRADE NEWS

'Argonaut' Welding Process

THE 'Argonaut' is a manual 'Argonarc' welding process using the inert gas shielded arc cut but with a consumable electrode and automatic regulation. The equipment is manufactured by the British Oxygen Co., Ltd.

The 'Argonaut' process uses a shielded arc with direct current (electrode positive) of relatively high amperage (50,000 amps per sq. in. minimum) on a continuously fed bare wire electrode of small diameter. The high current gives a very fast deposition rate. The manner of metal transfer by projection across the arc permits welding in all positions, and these last two attributes gives the process a large field of application on all types of fabrication where relatively heavy section aluminium is welded *in situ*.



The 'Argonaut' unit complete with associated equipment, including a D.C. generator, contactor, gun, and argon cylinder.

No flux is needed, and welds are of good quality, free from slag and inclusions, and also, of course, from post-weld corrosion problems. With multi-pass techniques there is no practical thickness limit, and comparatively few passes are needed because of the large amount of filler metal which can be deposited in unit time. Thin metal down to $\frac{1}{16}$ in. in thickness may also be welded by using smaller diameter electrode wire and lower current. Efficiency of the process on this type of work is comparable with that on heavy sections.

The arc is self-adjusting and the equipment includes a reel and feed motor to supply the filler wire to the torch or gun. The feed to the gun is via a special cable which also conducts the argon gas to provide the air-excluding shield around the arc and over the weld pool.

The automatic adjustment of the arc is governed by the burn-off rate of the wire which is fed at a constant speed through the gun. If the welder tends to draw the gun away from the work, so lengthening the arc, the burn-off rate is reduced and the wire feeds to the work and the arc is shortened. If the gun is brought too close to the work the reverse happens and thus a reasonable latitude is given to the operator without any adverse effect on the weld. The use of the process is not confined to light alloys; it may also be employed on stainless steel and copper base alloys. Certain types of welds between dissimilar metals such as copper to steel can also be successfully effected employing an aluminium bronze wire as the filler material.

From the operator's viewpoint, 'the 'Argonaut' process is very easy to use in the downhand position for both fillet and butt welding, but it is in vertical and overhead welding the fillets and butts that 'Argonaut' scores heavily. The most notable improvement is when welding in the overhead position because the effects of gravity on the weld metal crossing the arc are hardly noticeable. This allows an operator of only average welding skill to make welds in positions which otherwise would need a highly skilled operator.

The main difference in technique is principally the necessity to move along the joint far more quickly than is customary with ordinary arc welding, and once the technique has been mastered it is applicable to all positions and satisfactory welds result.—*British Oxygen Co., Ltd., Bridgewater House, Cleveland Row, St. James's, London, S.W.*1.

Economy in Retort Emptying

Time occupied in emptying retorts at the Hyde works of the North Western Gas Board has been reduced by 25% by the use of hand operated tippers designed and made at the works, mounted on Brush Electric trucks.

Fifteen times every 24 hours, the truck with one change of batteries, is emptying 28 retorts and delivering the coke to the grader in 45 min., against the 60 min. formerly taken by a petrol vehicle. We are informed that the cost of the motive power—*i.e.*, charging batteries—is only 2s. per day against 25s. per day for fuel for the petrol vehicle.

The tipping pan, which holds 8 cwt. of coke, is of $\frac{3}{16}$ in. metal, mounted on box girders welded to a shortened Brush standard chassis and swung on stub axles. Discharge of the load is obtained by releasing a catch attached to the box girder at the front and the tipping pan falls with its own weight. The return to transport position is by a sharp downward pull on the handle welded to the front of the tipping pan, which is then automatically secured by the catch.

We are informed that the trucks, in addition to being faster in operation and cheaper to maintain than petrol vehicles, were not affected by the dust, steam, and, occasionally, water from the retorts as were the petrol vehicles.

The industrial truck is manufactured by *Brush Coachwork, Ltd., Loughborough, Leicestershire,* and those described were supplied through the Lancashire area distributor—*Jewsbury's Motors, Ltd., Chapel Street, Manchester, 3.*

A USEFUL READY RECKONER for the discharge of water from steel pipes has been produced by Stewarts & Lloyds, Ltd., in the form of a handy plastic card measuring about 4 in. by 3 in. The formulæ on which the card is based were devised by Dr. J. S. Blair, of the company's research department at Corby, and were published in a paper presented by him to the Institution of Mechanical Engineers in February, 1951. They are not theoretical but are an epitome of all the reliable data available at that time. —*Stewarts & Lloyds, Ltd., Brook House, Upper Brook Street, London, W.1.*

Trade Publications

L. LIGHT & CO., LTD., Poyle Trading Estate, Colnbrook, Slough, send us a copy of their 1953 list of fine organic chemicals. This new edition contains over 2,300 items, many of which have not previously been available to research workers. Copies will be forwarded to readers on request.

LANCASHIRE DYNAMO & CRYPTO, LTD., St. Stephen's House, Victoria Embankment, Westminster, S.W.1, have published a new brochure on L. D. C. motors to British Standard dimensions.

FIELDEN (ELECTRONICS), LTD., Wythenshawe, Manchester, forward booklets and leaflets dealing with their multipoint thermometer, electronic thermostat, and electronic resistance thermometers. The later booklet runs to a matter of 21 pages and all the publications are fully illustrated.

WILLIAMS & JAMES (ENGINEERS), LTD., Chequers Bridge, Gloucester, send us a booklet describing their 'Pneumerstat,' which will be on show at the British Instrument Industries Exhibition at Olympia from June 30 to July 11, and also at the Engineering and Marine Exhibition at Olympia from September 3 to 17.

JOHN YUILLE (METAL WORKS), LTD., Hillington Industrial Estate, Hillington, Glasgow, S.W.2, have published a third edition, 1953, of their technical booklet describing 'Metwul' air cleaning and filtration units and dust control plants.

F. A. HUGHES & CO., LTD., and WESTINGHOUSE BRAKE & SIGNAL CO., LTD., are collaborating and pooling their respective experience of cathodic protection with the object of offering their combined technique in the most practical and comprehensive form now known as the 'Guardian Service.' This embraces the supply of the 'Guardian' and 'Westalite' cathodic protection equipment and offers full consultative and design facilities as well as surveys in the field. It is applicable to all forms of buried or water-immersed metallic structures. Full particulars can be obtained from *F. A. Hughes & Co., Ltd., Cathodic Protection Division, Bath House, 82, Piccadilly, W.1.*

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"A match struck...an explosion... petrol-sprayed I became a living torch... but my 13-year old Nu-Swift Extinguisher saved me from agonizing death." Everyone has too many fire risks. What would you have done ?
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In Every Ship of the Royal Navy

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OXIDE

DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

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GAS PURIFICATION & CHEMICAL COMPANY LIMITED
ESTABLISHED 1873
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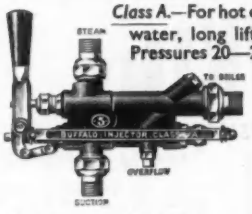
Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

BUFFALO INJECTOR

Class A.—For hot or cold water, long lifts, etc. Pressures 20—200lbs.



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GREEN & BOULDING, LTD.
162a Dalston Lane, London, E.8

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *
KETTLE DESCALER

* For resale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX.

PATENTS

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, A.I.Fl.E., Patent Agent.)
Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

ASSISTANT ACCOUNTANT required in Hong Kong. Knowledge of Gas Accounts desirable. Salary totals £1,380 per annum free accommodation, passage paid. Apply: Hong Kong & China Gas Co., Ltd., 148, Gresham House, London, E.C.2.

CHIEF DRAUGHTSMAN. This Company is expanding its London Drawing Office and requires a man with extensive experience in the design of mechanical handling plant for gas and allied industries, to take charge.

Applicants to state age, experience and salary required to :—W. J. JENKINS & CO., LTD., BEEHIVE WORKS, RETFORD, NOTTS.

A QUALIFIED GAS FITTER is required by the Research & Development Division of the Calor Gas (Distributing) Co., Ltd., Coombelands, Addlestone, Surrey. Applicants must have experience of all gas appliances and of the use of copper tubing. Ability to drive and/or fitting shop experience would be an advantage, but not essential. Wages will be on a par with Standard Scales. Successful applicant will be eligible for the Company's non-contributory superannuation scheme, bonus scheme and free mid-day canteen. State full details of qualifications, experience, age, together with three names as references.

WEST MIDLANDS GAS BOARD

CONSTRUCTIONAL ENGINEER

APPLICATIONS are invited for the appointment of CONSTRUCTIONAL ENGINEER at Board Headquarters located in Birmingham.

Candidates must have had a wide experience in Constructional Engineering in the Gas Industry.

The salary offered is £2,000 per annum, the post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

EASTERN GAS BOARD

CAMBRIDGE DIVISION

TECHNICAL ASSISTANT—DISTRIBUTION

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT (DISTRIBUTION) at the Divisional Chief Office.

Candidates should possess the Institution of Gas Engineers' Certificate in Gas Engineering (Supply) or equivalent qualification, and in addition to practical experience of mains and service work (low and high pressure) should have experience in the design and layout of distribution systems and estimation of costs.

The salary will be in accordance with the National Salary Scales for Gas Staffs within the range of Grades VI-VIII according to experience.

The successful candidate will be required to pass a medical examination and become a member of the Board's Staff Pension Scheme.

Applications stating age, qualifications and experience, and giving the names of two referees should reach the undersigned not later than fifteen days after the appearance of this advertisement.

J. HUNTER-RIOCH,
General Manager.

52, Sidney Street,
Cambridge.
April 20, 1953.

EASTERN GAS BOARD

NORWICH DIVISION

TECHNICAL ASSISTANTS—
NORWICH GROUP

APPLICATIONS are invited for the following positions, the commencing salaries for which will be within Grade A.P.T. VI (£490-£570 per annum) of the National Salary Scales for Gas Staffs.

TECHNICAL ASSISTANT, NORWICH WORKS required to assist in the operation and technical control of the Works which has a maximum output of approximately 5 million cubic feet per day. Experience with Glover West Continuous Vertical Retorts would be an advantage.

TECHNICAL ASSISTANT, SMALL WORKS required to assist in the supervision and technical control of the smaller Works within the Norwich Group, having outputs between 12 million and 70 million cubic feet per year. Experience on small Works with stop-ended Horizontal Retorts would be an advantage.

Candidates for both positions, preferably between 25 and 30 years of age, should possess suitable qualifications and experience and, if successful, will be required to pass a medical examination and join the Board's Superannuation Scheme.

Applications, stating age, qualifications and experience, together with the names of two referees, should reach the undersigned within fifteen days of the appearance of this advertisement.

J. V. KNIGHT,
Manager.

Norwich Group,
Eastern Gas Board,
Bishop Bridge,
Norwich.

NORTHERN GAS BOARD

SUPERVISOR—
INSTRUCTOR OF ENGINEERING STUDENTS

APPLICATIONS are invited for the post of SUPERVISOR-INSTRUCTOR of the Board's engineering students. The duties of the appointment will be to superintend the studies of young men training for professional qualifications in Gas Engineering and to give instruction in the "main subjects." Candidates should be qualified in gas engineering, preferably with a University degree, and teaching experience will be an advantage.

The post will be pensionable and the salary will be £1,000 per annum; the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with details of present and previous employment, and giving the names of two referees, should reach the undersigned not later than fifteen days after the appearance of this advertisement.

JOHN F. JACKSON,
Secretary.

30, Grainger Street,
Newcastle-upon-Tyne, 1.

NORTHERN GAS BOARD

DARLINGTON DIVISION
TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the Darlington Unit of the Northern Gas Board.

Candidates should be experienced in gas Manufacture and works maintenance with Continuous Vertical Retorts, C.W.G. and ancillary plants. Preference will be given to applicants holding the Institution of Gas Engineers certificate in Gas Engineering (Manufacture), and the successful applicant will be required to undertake shift duties.

Conditions of service will be in accordance with the National Joint Council for Gas Staffs Agreement. Salary—Provincial 'A', Grade A.P.T. VI—£490 to £570 per annum, initial placing according to experience, plus an allowance for shift duties.

Applications, stating age, qualifications and experience together with the names of two referees, to be sent to Charles Hindle, Esq., Sub-Divisional Manager, Northern Gas Board, Darlington Division, Gas Offices, John Street, Darlington, not later than May 9, 1953.

F. WILSON,
Divisional General Manager.

April 15, 1953.

PLANT FOR SALE & WANTED

FOR SALE, SKIP HOIST (Strachan & Henshaw) fully automatic, unused and not assembled. Capacity 50 tons per hour.—Jamestone Quarry, Ltd., Haslingden, Lancs. *Tel.*: Rossendale 1440.

URGENTLY REQUIRED

GASHOLDER Charge Hand ERECTOR with experience of Welded and Rivetted Gasholders of 1,000,000 cub. ft. capacity and over. Must have initiative and be able to utilise unskilled labour. High rate of wages paid, outside allowance and bonus scheme. Apply in writing, giving details of past contracts carried out to: Personnel Department, DURIE FOUNDRY, Leven. HOUSE available to man who proves suitable.

EDUCATIONAL

THE UNIVERSITY OF LEEDS

CHARLES BROTHERTON SCHOLARSHIP

APPLICATIONS are invited for the above Scholarship of the value of £125 a year, tenable in the Department of Coal Gas and Fuel Industries. This Scholarship is provided to enable students to follow courses in Chemical Engineering or Gas Engineering. In cases where the candidate reaches the required standard, the Scholarship may be supplemented by a State Scholarship awarded by the Ministry of Education.

The Scholarship is open to applicants of British Nationality from School or from Industry, who are qualified to enter upon a degree course.

Applications should reach the Registrar, from whom further particulars and forms of application may be obtained, not later than June 30, 1953.

THE UNIVERSITY OF LEEDS

POWER-GAS CORPORATION SCHOLARSHIP

APPLICATIONS are invited for the above Scholarship of the value of £150 a year, which has been provided to enable suitably qualified students to undertake a course of study leading to a degree in either Gas Engineering, Chemical Engineering, Mechanical Engineering or Civil Engineering in the University.

Preference will be given to candidates who reside within the Borough boundaries of Stockton-on-Tees or Thornaby-on-Tees, or who attended a Grammar or Secondary School in Stockton or Thornaby, or who are either employees or the children of employees of the Power-Gas Corporation Ltd., or of Messrs. Ashmore, Benson, Pease & Co., Ltd. Applicants should be under the age of 19 on October 1, 1953.

Applications should reach the Registrar, from whom further particulars and forms of application may be obtained, not later than June 30, 1953.

Almost every established practice

IN THE GAS INDUSTRY began with the idea of improving the product and thereby the service to the community.

Upon this basis many processes and plant of varying complexity have been evolved by Holmes and have proved their usefulness.

HOLMES
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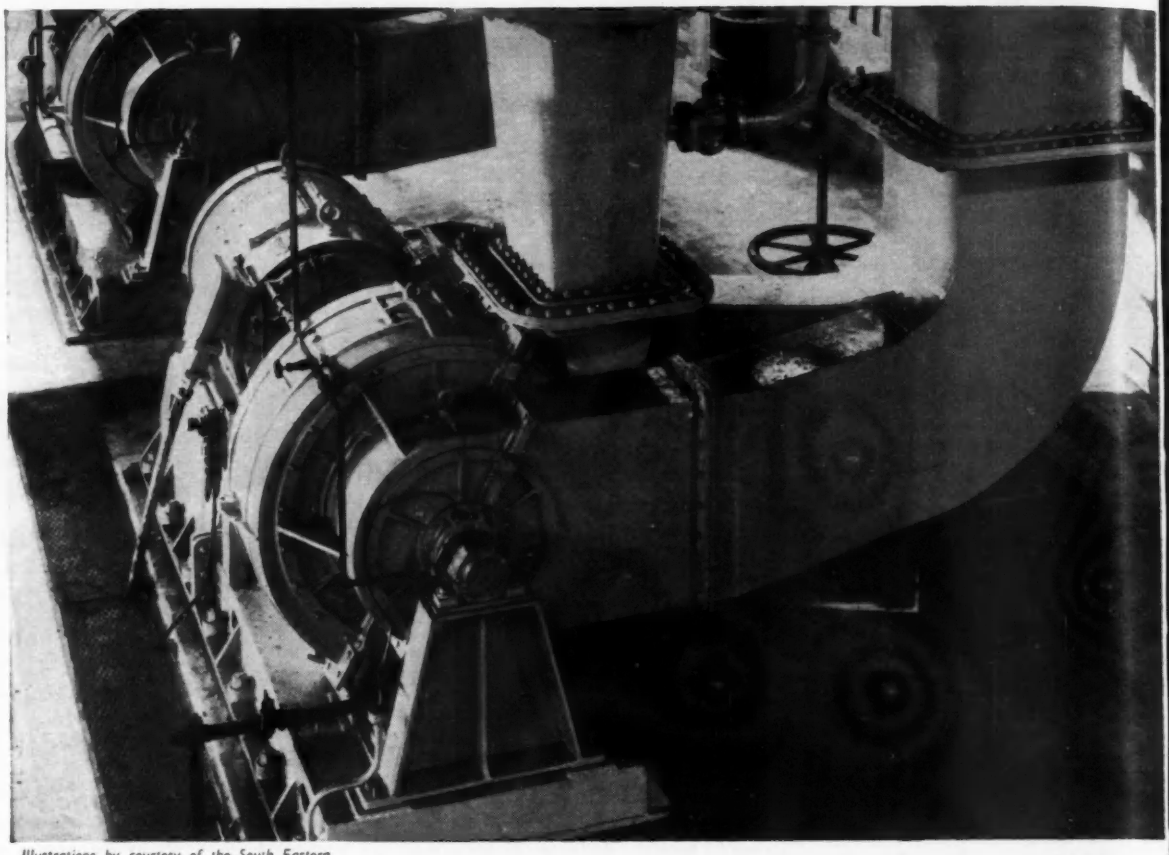


Illustrations by courtesy of the South Eastern Gas Board and Messrs. Humphreys & Glasgow Ltd.

Gas Boosting *

*

LARGE ILLUSTRATION: *42" type 9 double width double inlet gas boosters.*

DUTY: 1,095,000 cu. ft. per hour producer gas at 104°F. saturated, giving 28" w.g. differential over inlet and outlet connections taking 138 H.P.

SMALL ILLUSTRATION: *40" type 15 air blowers.*

DUTY:	*Closed outlet*	*Delivery*
Air quantity	*nil*	*12830 c.f.m.*
Speed r.p.m.	*1480*	*1475*
Static pressure	*15.8" w.g.*	*13" w.g.*
Power absorbed	*13 B.H.P.*	*39 B.H.P.*

Part of an installation at the East Greenwich Gas Works for the supply of South London's gas are the "TORNADO" gas boosters illustrated above. Each is capable of shifting over a million cubic feet of producer gas an hour, and each was supplied with cast iron gas tight casings with detachable segments for easy servicing, stainless steel impeller and shaft, self aligning roller bearings and flexible couplings. One of the boosters was arranged for motor drive and the other for steam turbine.

FAN ENGINEERING AND INDUSTRIAL GAS EQUIPMENT

We are manufacturing gas boosters which cover a range of from 5,000 to 1,500,000 cubic feet per hour, and if you are concerned with the movement of air or gas, ask us to send you Publication No. 5/7, a survey of the standard range of "TORNADO" high pressure blowing and exhausting fans.

Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4522 (twelve lines) 'Grams: "Keithblac, Norphone, London."

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4, Wednesday, April 29, 1953

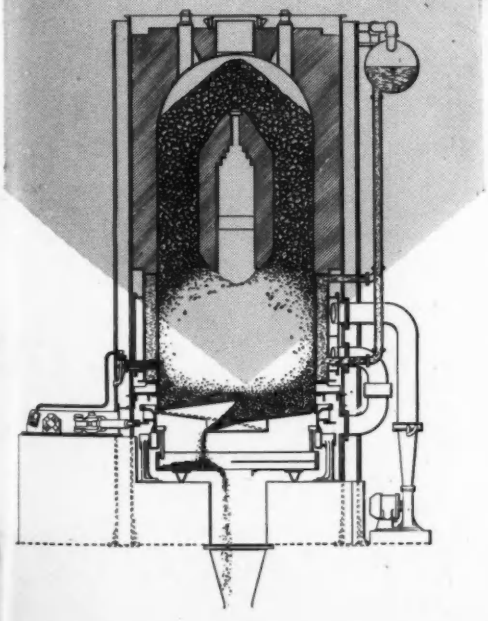
WEST'S "HOT GAS" MECHANICAL PRODUCER

HOT GAS EFFICIENCY 90%

REDUCES LABOUR COST

SAVES FUEL

DUST EXTRACTION 90%



West's "Hot Gas" Mechanical Producer is a notable development in carbonization technique.

Fuel gas is drawn from immediately above the flare bed by a centrally placed offtake which is completely insulated, enabling full advantage to be taken of the sensible heat conveyed DIRECT to the setting. Ashes, removed by a revolving helical grate, show a marked reduction in combustible content. Constant depth of ash below the fuel bed is maintained by a novel device which controls the speed of the grate.

There is little variation in fuel gas quality. The producer is adaptable to various cokes and only low blast pressure is required.

West's Gas IMPROVEMENT CO. LTD.

ALBION IRONWORKS · MILES PLATTING . MANCHESTER 10

Telephone: COLlyhurst 2961 Telegrams: Stoker, Manchester

London Office: Columbia House, Aldwych, W.C.2. Telephone: HOLborn 4108-9 Telegrams: Wesgasco, Estrand

P2

The Ascot jigged wall fitting cuts the cost of installing sink gas water heaters to a few shillings per house or flat. Its reception has been tremendous. The wall fitting is chased in *during the erection of houses or flats.* Only neat plugged ends are left exposed. Cost is negligible. A tenant can then arrange at any time for an Ascot sink heater to be fitted, a job which takes only about 20 minutes and leaves the surface decoration undisturbed.

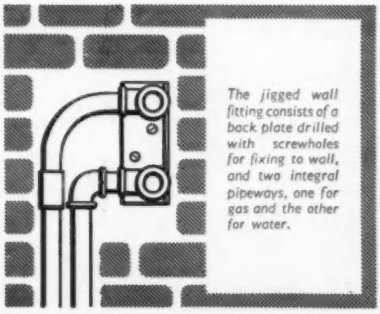
The help it gives *you*, the gas salesman, is obvious. The jigged wall fitting is in fact an advance salesman of unsurpassable reliability!

20,000 Ascot Jigged Wall Fittings cheapen installation

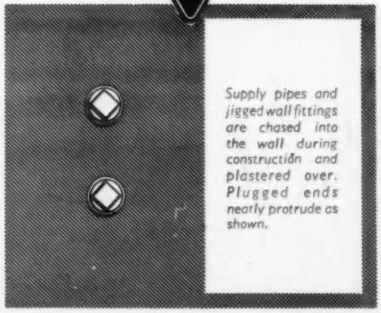
44 housing authorities have already adopted the jigged wall fitting. Over 20,000 have been installed. Housing authorities have adopted it because it provides at extremely low cost the means of obtaining an alternative hot water supply for the kitchen. *Tenants particularly appreciate this convenient service — which supplements the solid fuel heating system, especially in the summer, and at the same time saves money and fuel.*

The jigged wall plate takes the Ascot 503 range of heaters and the Ascot RS52/1 boiling water heater.

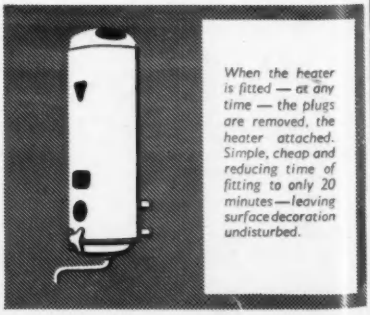
ASCOT



The jigged wall fitting consists of a back plate drilled with screwholes for fixing to wall, and two integral pipeways, one for gas and the other for water.



Supply pipes and jigged wall fittings are chased into the wall during construction and plastered over. Plugged ends neatly protrude as shown.



When the heater is fitted — at any time — the plugs are removed, the heater attached. Simple, cheap and reducing time of fitting to only 20 minutes—leaving surface decoration undisturbed.

ASCOT GAS WATER HEATERS LIMITED · 255 NORTH CIRCULAR ROAD NW.10.